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March 26, 2009

Mr. Steve Faryan
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Chicago, IL 60604

**SUBJECT: DRAFT Event-Based Monitoring Plan - Hartford Hydrocarbon Plume Site
AECOM Project Number 01005-530**

Dear Mr. Faryan,

Attached is the Draft Event-Based Monitoring Plan (EBMP), prepared by AECOM Inc. (AECOM) on behalf of the Hartford Working Group (HWG) (Atlantic Richfield Company; The Premcor Refining Group Inc.; and Shell Oil Products U.S.) for the Hartford Hydrocarbon Plume Site, in Hartford, Illinois. The Draft EBMP is intended to replace the Effectiveness Monitoring Plan (EMP), dated July 12, 2007 and supersede the EBMP dated April 7, 2008. Properties currently enrolled in the EMP will transition to the EBMP. It is the HWG's understanding that the Agencies will present the EBMP to the Village of Hartford residents/property owners following final approval.

The HWG is very interested in implementing the Draft EBMP and discontinuing the EMP. However, we recognize the importance of introducing this new program to the residents/property owners of the Village of Hartford. Therefore, the HWG would like to discuss implementation of the Draft EBMP with the Agencies during our meeting on April 8, 2009 in O'Fallon, Illinois.

If you have any questions, please feel free to contact us.

Sincerely yours,

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Senior Project Manager

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Enclosure

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Prepared for:
Hartford Working Group

Hartford Hydrocarbon Plume Site Event-Based Monitoring Plan Hartford, Illinois Draft Work in Progress

AECOM, Inc.
March 2009
Document No.: 01007-530

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March 2009
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1.0 Introduction

This Event-Based Monitoring Plan (EBMP) was developed for the Hartford Area Hydrocarbon Plume Site in Harford, Illinois and supersedes the EBMP dated April 7, 2008. This EBMP was developed through a series of meetings and discussions with Agencies¹ and based on the agreement reached with the Agencies Representatives on December 10, 2008. Upon approval by the Agencies, the EBMP will replace the Effectiveness Monitoring Plan (EMP), dated July 12, 2007. Addresses currently enrolled in the EMP will transition to the updated EBMP. This transition, including a description of the EBMP and reasons for the changes, will be presented to the Village of Hartford residents/property owners by the Agencies. The EBMP is a dynamic document that will be revised in the future as information from monitoring events is evaluated.

The objective of the EBMP is to determine if increases in the Mississippi River stage, above an agreed upon threshold, have resulted in changes in subsurface pressure or vapor concentrations that could potentially contribute to vapor intrusion in the Monitored Area. Event-based monitoring is a sequential monitoring approach to assess potential changes in pressure or vapor concentration which may increase the potential for vapor intrusion, due to disruptions to the subsurface equilibrium. Monitoring begins at the regional level, and based on established thresholds and triggers, focused areas at the residential level are identified. Further screening and/or sampling may be required at this level.

The Monitored Area (**Figure 1 Event-Based Monitoring Probe Locations**) includes addresses in North Hartford bounded by Rand Avenue to the north, the ROST response boundary to the south, Old St. Louis Road to the west and North Olive Street to the east. Addresses located outside of the ROST response boundary but inside the Buffer Zone are not part of the Monitored Area. However, monitoring of properties located inside the Buffer Zone may be conducted based on screening results for monitoring points as selected by the Agencies.

Soil Vapor Extraction (SVE) System Effectiveness Monitoring is currently conducted on a monthly basis to evaluate the effectiveness of the SVE system located in the Monitored Area. Event-based monitoring screening samples will be collected from SVE System Effectiveness Monitoring sampling probes. The EBMP utilizes SVE System Effectiveness Monitoring data to establish values to which the EBMP threshold criteria are compared.

The following is a summary of the EBMP activities (see **Figure 2 Event-Based Monitoring Plan (EBMP) Flow Chart**):

- An event is activated;
- Collect field screening data from event-based monitoring probes;
- Identify residential focus area(s) within the Monitored Area for additional data collection;
- Determine if properties located in the focused investigation area have mitigation measures;
- Notify residents/property owners located in the focus area;
- Collect residential screening data;

¹ United States Environmental Protection Agency (USEPA); Illinois Environmental Protection Agency (IEPA); Illinois Department of Public Health (IDPH); and Agency for Toxic Substance and Disease Registry (ATSDR).

- Evaluate residential screening data and determine if addresses with mitigation measures trigger residential sampling;
- Collect residential samples; and
- Evaluate and report residential screening and sample results.

The Hartford Working Group (HWG) Contingency Plan (ENSR, April 1, 2008) remains in effect during the event-based monitoring program. The Contingency Plan is provided as **Attachment A**.

2.0 Event-Based Monitoring Participation

All addresses located within the designated Monitored Area (as described in Section 1.0) are eligible to participate in event-based monitoring, however, residents/property owners will have the opportunity to "Opt-Out" of this program. An "Option Not to Participate in Event-Based Monitoring Agreement" (Opt-Out Agreement) will be presented to all residents/property owners located within the EBMP Monitored Area by the Agencies. The letter contains a description of event-based monitoring, explains that choosing to opt-out of event-based monitoring will result in no further contact from the HWG, and provides instruction on how to reverse the Opt-Out Agreement if the resident/property owner chooses to participate in event-based monitoring in the future. The Opt-Out Agreement is included in **Attachment B**.

3.0 Event Definition

The definition of an "Event" was developed based on analysis of the Mississippi River stage and the historical incidents in the Village of Hartford. **Attachment C**, "Event Definition Analysis" dated April 1, 2008, provides a more detailed discussion pertaining to development of the definition of an event.

For the purposes of the EBMP, an event is defined as:

- After the river stage has risen above 14.5 feet (410 National Geodetic Vertical Datum (NGVD)), an event shall be declared to have occurred for purposes of initiating event-based monitoring when an increase in the river stage exceeds two (2) feet in a 24-hour period.

The above definition of an event is based on the Mississippi River stage as measured above the Lock and Dam 26 (in Alton, Illinois) tailwater datum. Once an event is initiated, activities are based on an eight (8)-day period. Therefore, any subsequent two (2)-foot increase (within a 24-hour period) in river stage that occurs within eight (8) days of the initial increase which triggered the event will be considered part of the initial event. A two (2)-foot increase in a 24-hour period that occurs more than eight (8) days after the last two (2)-foot increase (assuming the river stage is above 14.5 feet), will be considered a new event.

4.0 River Stage Monitoring

AECOM will monitor the current river stage and predicted levels on a daily basis using the existing Advanced Hydrologic Prediction Service (AHPS) from the National Weather Service (NWS) for the Mississippi River at Alton, found at:

<http://www.crh.noaa.gov/ahps2/hydrograph.php?wfo=lsx&gage=alni2&view=1,1,1,1,1,1>

The AHPS has developed hydrographs which identify a seven (7)-day forecast projection for the tailwater depth which can be used to forecast a potential event. The river stage and predicted levels are monitored daily and recorded on AECOM's internal daily report (the daily report will record time of day, current river stage, and predicted river stage for each of the following seven (7) days). When the river stage rises above 14.5 feet (410 NGVD), AECOM will review and record the AHPS predicted river level stage twice daily, once at the beginning and end of each day (seven (7) days a week).

5.0 Response Status and Event Notification

The response status and event notification shall consist of the following steps:

- **Alert** – Alert status is defined as the potential for the river stage to increase more than two (2)-feet in 24 hours (within the upcoming 7 days) after the river reaches a stage of 14.5 feet (410 feet NGVD), as predicted by the AHPS from the NWS. The Agencies, HWG, and AECOM field teams will be notified of the Alert status. AECOM will begin assembling the materials needed to conduct the event-based monitoring activities. When under Alert status, AECOM will monitor and record the predicted river level stage at the beginning and end of each work day.
- **Activation** - Activation status is defined as an event occurring as defined in Section 3.0. The Agencies, HWG, and AECOM field teams will be notified of the Activation status, and event-based monitoring activities will commence. AECOM will request from the Agencies identification of up to three (3) event-based monitoring probes located within the Buffer Zone to include during monitoring probe screening activities.

6.0 Event-Based Monitoring Screening Criteria

Screening thresholds have been developed to assess the potential for vapor intrusion in the Monitored Area. These thresholds focus on increases in pressure and/or total hydrocarbon (THC) concentrations as measured by a calibrated flame ionization detector (FID).

6.1 Monitoring Probe Screening Thresholds

Monitoring probe screening thresholds have been developed to assess locations within the Monitored Area where changes in sub-surface conditions present a potential for vapor intrusion. The thresholds (identified below) compare the Monitoring Probe Screening data to the most recent corresponding SVE System Effectiveness Monitoring measurements. Pressure and FID measurement will be evaluated to determine if a threshold has been exceeded.

Vapor Condition Thresholds:

- FID monitoring measurement increase, when compared to the most recent corresponding SVE System Effectiveness Monitoring measurement, equals or exceeds 1,000 parts per million volume (ppmv) in Zone A (0-10 feet below ground surface (BGS)). **Figure 1-1** provides Zone A monitoring probe locations;
- FID monitoring measurement increase, when compared to the most recent corresponding SVE System Effectiveness Monitoring measurement, equals or exceeds 10,000 ppmv in Zone B (>10-20 feet BGS). **Figure 1-2** provides Zone B monitoring probe locations; or

- FID monitoring measurement increase, when compared to the most recent corresponding SVE System Effectiveness Monitoring measurement, equals or exceeds 100,000 ppmv in Zone C (>20-30 feet BGS). **Figure 1-3** provides Zone C monitoring probe locations.

Pressure Condition Threshold:

- Measured pressure increase, when compared to the most recent corresponding SVE System Effectiveness Monitoring measurement, is greater than 0.5 inches of water in Zone A, Zone B, or Zone C **and** the corresponding event-based monitoring FID measurement exceeds 10,000 ppmv.

If any of the above stated thresholds are exceeded, then the next level of assessment (Residential Screening) is triggered at addresses corresponding to the EBMP probe locations (**Tables 1 and 2**). **Tables 1 and 2** were created to “map” EBMP monitoring probe locations to addresses, to allow focused assessments where changes in subsurface conditions have the potential for vapor intrusion. In general the EBMP monitoring probes are mapped to corresponding addresses in the following manner:

- EBMP monitoring probes located within 125 feet of the address;
- Where EBMP monitoring probes are not located within 125 feet of an address, the nearest monitoring probe was utilized;
- EBMP monitoring probes are constructed in multiple depth intervals;
- Where possible, based on distance, multiple EBMP monitoring probes in Zone A and/or Zone B and/or Zone C are associated with each address; and
- EBMP monitoring probes closest to the address are given priority to probes at greater distances.

6.2 Residential Screening Thresholds

Residential screening thresholds have been developed to assess if conditions at a residence has the potential for vapor intrusion for addresses with mitigation measures only. Residential screening thresholds were developed based on review of historical FID measurements, corresponding analytical results, and discussions with the Agency representatives.

The following describes the residential screening thresholds:

- Addresses with sub-slab monitoring ports (SSMPs)
 - FID measurement in any SSMP greater than 500 ppmv; or
 - FID measurement in indoor air is greater than 10 ppmv **and** the FID measurement in any SSMP is greater than 100 ppmv.
- Addresses without SSMPs
 - FID measurement in indoor air is greater than 20 ppmv as measured in the basement of the property, if present. If the property does not have a basement, the indoor air FID measurement will be obtained from the living space of the property.

If any of the above residential screening thresholds are exceeded, samples of indoor air and soil vapor from SSMPs will be collected at the associated address. Residential sampling will not be completed under the EBMP for addresses that do not have mitigation measures.

7.0 Event-Based Monitoring Activities

Event-based activities will commence to the best of AECOM's ability within 24 hours of the occurrence of the defined event. The monitoring activities shall be conducted during daylight hours only and may be delayed if Monitored Area conditions inhibit the safe completion of the work (i.e., adverse weather conditions). At no time will safety be compromised.

7.1 Collection of EBMP Probe Field Data

Field screening data shall be collected from the EBMP Monitoring Probes identified in **Table 1**. In addition, field screening data will be collected from up to three (3) locations within the Buffer Zone (**Table 2**) as identified by the Agencies. Pressure measurements and soil vapor screening sample collection shall be conducted and conform to the Regional SVE System Effectiveness Monitoring Standard Operating Procedure (HWG SOP 02 **Attachment D**). The Event-Based Monitoring Field Data Form (**Attachment E**) shall be used to document field data collected.

Soil vapor screening samples will be collected in Tedlar® bags in accordance with the HWG SOP 02. Soil vapor screening samples shall be delivered to the AECOM field laboratory and screened for volatiles using a calibrated photo ionization detector (PID) and FID, and screen for oxygen (O₂), carbon dioxide (CO₂), and methane in accordance with Soil Vapor Field Laboratory Screening Procedures (HWG SOP 03 **Attachment F**). Soil vapor screening results shall be documented on the Event-Based Monitoring Probe Screening Results Form (**Attachment G**). The EBMP field forms used to collect screening data shall be submitted to the AECOM Project Manager or designee for document management.

7.2 Data Review

The original Event-Based Monitoring Field Data Form and Event-Based Monitoring Probe Screening Results Form shall be reviewed by the AECOM Project Manager or his/her designee. The monitoring port pressure data and field screening data will be entered from the field forms into an electronic spreadsheet.

The most recent corresponding SVE System Effectiveness Monitoring data for each monitoring probe will be added to the spreadsheet. The data will be evaluated to determine the monitoring probe locations (if any) where screening thresholds have been exceeded (**Figure 3 EBMP Monitoring Probe Screening Thresholds**). Where there are threshold exceedances, **Tables 1 and 2** will be utilized to identify addresses associated with EBMP probe locations for Residential Screening. The identified addresses will be evaluated to determine the appropriate notification procedure for Residential Screening.

7.3 Process for Contacting Residents/Property Owners

Residents/property owners at addresses mapped to EBMP probe locations where a threshold has been exceeded will be notified and a request made to screen the property. Notification will be provided via telephone or "Notification Card", depending on the status of the address as described below.

Notification will be conducted using the following criteria based on the status of the address (**Table 3**):

- Addresses with mitigation measures that have **not** been removed from the EMP - Contact via telephone to request participation in event-based screening. One (1) attempt will be made to notify resident/property owner via telephone if:
 - AECOM personnel speak directly to the resident/property owner; or
 - AECOM personnel are able to leave a voicemail message.

- A second attempt to notify the resident/property owner via telephone will be made only if AECOM is unable to speak directly with the resident/property owner and is unable to leave a voice message.
- Addresses that have been removed from the EMP - Contact via "Notification Card".
- Addresses that do not have mitigation measures - Contact via "Notification Card".

A "Notification Card" (**Attachment H**) is a post card requesting that the resident/property owner contact AECOM if they want their property screened during the event. The Notification Card will be placed on the front door of eligible addresses. The Notification Card instructs the resident/property owner how to contact AECOM to participate.

Once a resident/property owner has been notified via telephone contact or Notification Card, it is the resident/property owner's sole responsibility to contact AECOM to schedule event-based screening.

7.4 Procedures for Screening Residential Properties

At addresses where associated EBMP monitoring probe screening results exceed a threshold, residential screening will be conducted utilizing a calibrated combination PID/FID and a lower explosive limit (LEL) detector. Where access agreements are currently in place, these agreements will be utilized to authorize access for event-based monitoring activities. For properties where access agreements have not been previously executed, AECOM field personnel will provide an access agreement to the resident and request authorization prior to initiating any activities. For leased properties, the access agreement will be presented to the tenant and authorized by the tenant. The tenant can only authorize event-based monitoring activities. For intrusive work, such as SSMP installation, authorization must be obtained from the property owner. If the resident does not authorize the access agreement, event-based monitoring will not be completed at the property and the Agencies will be informed.

Indoor air screening shall include measurements collected from the first floor, basement (if present), and crawlspace (if present). Screening measurements shall be collected centrally in each of the first floor rooms. Where applicable, screening measurements shall be collected in basements adjacent to floor drains, where there are visible cracks in floor and walls, and at wall and floor penetrations that indicate signs of damage. Additionally, screening measurements will be collected at the access entrance to crawl space areas. No personnel will physically enter crawl space areas or confined spaces. Residential screening locations and measurements will be recorded on the Event Based Monitoring - Residential Monitoring Data Sheet (**Attachment I**).

Where SSMPs are present, they shall be screened concurrently with indoor air screening activities. Pressure and LEL measurements shall be collected from SSMPs located at the address. Soil vapor samples shall be collected from each SSMP for screening using Tedlar® bags. The samples shall be delivered to the field laboratory and screened for PID, FID, O₂, CO₂, and methane as defined in the field Soil Vapor Field Laboratory Screening Procedure (HWG SOP 03). Residential screening locations and measurements will be recorded on the Event Based Monitoring - Residential Monitoring Data Sheet (**Attachment I**).

The Event Based Monitoring - Residential Monitoring Data Sheet shall be utilized to survey and document conditions at the address. The form will be completed with input from occupant and visual observations noted by AECOM.

Screening results for addresses with mitigation measures will be compared to the Residential Screening Thresholds (**Figure 4**) to determine if Residential Sample collection shall be completed under the EBMP. Note: Where conditions such as apparent gas leaks from appliances/furnaces affect FID measurements, residential samples will not be collected.

If sample collection is required, notification will be made via telephone using the following criteria:

- One (1) attempt will be made to notify resident/property owner via telephone if:
 - AECOM personnel speak directly to the resident/property owner; or
 - AECOM personnel are able to leave a voicemail message.

A second attempt to notify the resident/property owner via telephone will be made only if AECOM is unable to speak directly with the resident/property owner and is unable to leave a voice message. If AECOM is not successful in contacting the resident/property owner during the second notification attempt, AECOM will notify the Agencies.

For addresses where Residential Screening was complete, but mitigation measures are not present, sample collection will not be conducted. Screening results for these addresses will be reported to the Agencies only.

7.5 Residential Sample Collection Procedures

Where Residential Screening results exceed a threshold, Residential Sampling consisting of indoor air and sub-slab (where present) sampling will be conducted. Residential sampling will only be conducted at addresses where mitigation measures have been completed.

Indoor air samples will be collected from one (1) location each on the first floor, basement (if present) and crawlspace (if present). The first floor indoor air sample shall be collected from the central living area (i.e. living room). The basement indoor air sample shall be collected at the location where initial screening identified the highest FID screening measurement. If basement FID screening measurements are consistent, the sample shall be collected from a location adjacent to a potential vapor intrusion pathway such as a floor drain, sump pit, or floor or wall penetrations that indicate signs of damage. The crawlspace indoor air sample shall be collected if the area can be accessed safely. Sub-slab samples will be collected from each SSMP if present.

The Event Based Monitoring - Residential Monitoring Data Sheet shall be utilized to survey and document conditions at the address. The form will be completed to the extent possible with input from occupant and visual observations noted by AECOM.

Indoor air samples will be collected using individually-certified Summa™ canisters over an approximate 24-hour period. Sub-slab vapor samples will be collected concurrently with indoor air samples using batch-certified Summa™ canisters over the same time period. AECOM will collect and document indoor air and sub-slab screening data in conjunction with sampling activities (screening data will be collected from the same location as sample locations), as discussed above.

AECOM will complete sample chain-of-custody (COC) forms to accompany each sample collected to the laboratory. The laboratory will send an electronic sample receipt confirmation, listing all samples received (sample IDs), dates sampled, analyses requested, and the vacuum reading measured by the laboratory. A copy of the COC will also be included with the electronic sample receipt confirmation. AECOM will then check this information against the COC to confirm that the laboratory has entered all information correctly into their Laboratory Information Management System (LIMS) system. Any discrepancies between the COC and sample receipt confirmation will be identified and resolved with the laboratory.

An expedited laboratory turn-around-time of five (5) days will be assigned to the vapor samples if the sub-slab FID reading exceeds 500 ppmv, or if the LEL is greater than one (1) percent. If no FID or LEL reading is available, then a PID reading greater than 15 ppmv will be used as to assign an expedited laboratory turn-around-time. The Agencies will be notified within 24 hours that a location has an expedited laboratory return time assigned to the vapor samples because of the FID, PID or LEL values. The Residential Event-Based

Monitoring Decision Tree (Decision Tree), see Section 7.8, provides a summary of potential residential monitoring outcomes and actions. Locations with a sub-slab depressurization system (SSDS) would be evaluated based on individually derived monitoring outcomes and actions, as described in Section 7.8.

7.6 Sample Analysis

Indoor air and sub-slab soil vapor samples will be analyzed utilizing EPA Method TO-15 and ASTM D-1946 with laboratory specific modifications as required. **Table 4** provides the analyte list and the reporting limits for indoor air and sub-slab sample types.

If any sample is run initially at a dilution (due to elevated concentrations of target and/or non-target compounds), the laboratory will re-run the sample at the appropriate dilution(s) in order to obtain all required reporting limits for all compounds.

7.7 Analytical Data Review

Analytical results for residential samples collected will be evaluated using the comparison values (CVs) identified on **Table 5**, as provided by the ATSDR and IDPH (February 18, 2005) and as updated by the Agencies on June 16, 2006.

The CVs as developed by the Agencies are set below levels that, based on current information, might cause adverse health effects in the people most sensitive to such substance induced effects. Exposure to levels at or below CVs would not be expected to cause adverse health effects. It is important to note that exposure to a level above a CV does not mean that adverse health effects will occur, rather, the CVs are intended to serve as a screening tool to help public health professionals decide where additional evaluation might be needed. They may also be used to identify those situations that are not expected to cause adverse health effects. Therefore, the CVs will be used here for comparison with Monitored Area data and for decision making purposes.

7.8 Response to Analytical Data

The Decision Tree presented in **Table 6** will be utilized to evaluate addresses with mitigation measures only. The Decision Tree describes the process used to evaluate potential vapor intrusion and the effectiveness of the mitigation measures work conducted in residences with and without SSDS. This evaluation focuses on comparison of the sub-slab vapor and indoor air analytical data to CVs, pressure readings at properties with a SSDS, and the sufficiency of the data to assess the potential for vapor intrusion at the property. The Decision Tree is used to determine if vapor intrusion is occurring in at a property, what action(s) should be taken if vapor intrusion is occurring, and when and what change in monitoring frequency is necessary.

The Decision Tree addresses properties without a SSDS, homes with a SSDS, and Agency review for discontinuation of monitoring. The data from properties with SSDS are treated differently from those without a SSDS. The difference is that the sub-slab contamination below a property with a properly functioning SSDS is not treated as a vapor intrusion source.

If the results of samples which were expedited due to PID, FID, or LEL measurements (as discussed in Section 7.5) indicate benzene concentrations at or above $29 \mu\text{g}/\text{m}^3$ in indoor air from a known or suspected sub-surface vapor intrusion source, the residence would be evaluated as a Contingency Plan event until the home can be cleared by the Agencies (per the "Hartford Working Group Contingency Plan" dated April 1, 2008). The Contingency Plan is provided here as **Attachment A**.

Residents with sub-slab benzene concentrations above the acute comparison value for benzene ($290 \mu\text{g}/\text{m}^3$) will have both indoor and sub-slab samples collected weekly, subject to access. Weekly sampling will continue until sub-slab benzene concentrations decrease to below $290 \mu\text{g}/\text{m}^3$.

7.9 Management of Data

Data collected during event-based monitoring activities will be managed electronically. AECOM will check the electronic data files against the field forms and the summary table against the laboratory reports for transcription errors. Field information/data and laboratory deliverables, including receipt reports and electronic data deliverables (EDDs) will be uploaded into a database. Screening data shall be imported into a database and the resident information imported to the residence files and database. Any additions, deletions, or modifications to the data set shall be documented within the database. Upon completion of data tabulation, data evaluation, and QA/QC the EBMP results will be reported to the Agencies.

8.0 Reporting

Following completion of all activities related to an event, including receipt, review, and management of all analytical data, reporting will commence. A report summarizing event-related activities will be prepared for submittal to the HWG and Agencies. This report will include a brief description of the activities performed, tables summarizing the EBMP monitoring probe screening data (including initial and stabilized pressure readings), residential screening results, and residential analytical results (if samples were collected), and a discussion of additional planned activities, if any.

In addition to the above report, a table summarizing analytical results for a property at which Summa canister samples were collected, if any, will be transmitted to the property owner. Indoor air screening results for those addresses which do not have mitigation measures will be provided to the Agencies only and included in the above report.

Where expedited laboratory turn-around-time is required (Section 7.5) the Agencies will be notified by AECOM within 24 hours. AECOM will provide the property location and reason for the expedited-turn around (triggered by FID, PID, or LEL values) to the Agencies. Following receipt of the expedited analytical results, the results will be tabulated and submitted to the Agencies and residents/property owners.

Tables

Table 1
ROST Response Area - EBMP Monitoring Probes Mapped to Addresses

Well	Zone	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist
HMW-007	C	106 E. Birch St.	112.4																						
HMW-013	B	508 N. Delmar Ave.	107.7																						
HMW-040A	B	500 N. Old St. Louis Rd.	75.8	504 N. Old St. Louis Rd.	94.3																				
HMW-040B	C	500 N. Old St. Louis Rd.	75.8	504 N. Old St. Louis Rd.	99.4																				
HMW-042A	C	102 E. Watkins St.	63.8	101 E. Watkins St.	68.3																				
HMW-044A	B	309 N. Olive St.	78.7	313 N. Olive St.	79.3																				
HMW-044B	C	309 N. Olive St.	75.5	313 N. Olive St.	85.2																				
HMW-045A	B	715 N. Delmar Ave.	59.2	105 W. Birch St.	80.3																				
HMW-045B	C	715 N. Delmar Ave.	63.0	105 W. Birch St.	78.9	707 N. Delmar Ave.	109.7																		
HMW-047A	B	800A N. Delmar Ave.	119.2	800 N. Delmar Ave.	133.3																				
HMW-047B	C	800A N. Delmar Ave.	119.9	800 N. Delmar Ave.	137.3																				
HMW-053A	B	201 N. Olive St.	66.7																						
HMW-054A	B	213 N. Olive St.	50.3	215 N. Olive St.	54.6																				
MP-009D	C	107 E. Birch St.	76.4	101 E. Birch St.	100.7																				
MP-009S	A	107 E. Birch St.	77.7	101 E. Birch St.	100.6																				
MP-012D	C	111 W. Date St.	61.3	507 N. Delmar Ave.	83.2	108 W. Date St.	107.8	117 W. Date St.	116.7	112 W. Date St.	120.4														
MP-012S	A	111 W. Date St.	59.6	507 N. Delmar Ave.	85.1	108 W. Date St.	107.5	117 W. Date St.	114.8	112 W. Date St.	119.6														
MP-016D	C	112 E. Forest St.	38.6	114 E. Forest St.	45.6	117 E. Forest St.	53.2	106 E. Forest St.	73.3	111 E. Forest St.	85.5	116 E. Forest St.	89.9	121 E. Elm St.	91.8	105 E. Forest St.	119.3	125 E. Forest St.	129.6	122 E. Forest St.	148.1				
MP-016S	A	112 E. Forest St.	37.1	114 E. Forest St.	44.2	117 E. Forest St.	54.7	106 E. Forest St.	72.5	111 E. Forest St.	86.5	116 E. Forest St.	89.0	121 E. Elm St.	92.9	105 E. Forest St.	120.1	125 E. Forest St.	130.4	122 E. Forest St.	147.4				
MP-017	A	101 E. Watkins St.	1.5	102 E. Watkins St.	51.4	104 E. Watkins St.	71.4	105 E. Watkins St.	72.7																
MP-018	A	105 E. Watkins St.	29.8	104 E. Watkins St.	39.6	108 E. Watkins St.	45.2	102 E. Watkins St.	67.9																
MP-019	A	112 E. Watkins St.	49.3	116 E. Watkins St.	35.2	119 E. Watkins St.	48.3	120 E. Watkins St.	78.9																
MP-020	A	120 E. Watkins St.	33.9	123 E. Watkins St.	41.4	122 E. Watkins St.	51.6	116 E. Watkins St.	73.1	126 E. Watkins St.	93.0														
MP-021	A	126 E. Watkins St.	33.4	130 E. Watkins St.	53.1	122 E. Watkins St.	72.1	123 E. Watkins St.	89.1	125 E. Watkins St.	107.8														
MP-022	A	130 E. Watkins St.	38.7	134 E. Watkins St.	54.9	126 E. Watkins St.	75.3	139 E. Watkins St.	85.2																
MP-029A	B	101 E. Birch St.	27.5	106 E. Birch St.	128.7	720 N. Delmar Ave.	170.9																		
MP-029B	C	101 E. Birch St.	27.3	106 E. Birch St.	128.8	720 N. Delmar Ave.	171.4																		
MP-029C	C	101 E. Birch St.	28.8	106 E. Birch St.	127.5	720 N. Delmar Ave.	173.9																		
MP-030A	B	615 N. Delmar Ave.	27.1	610 N. Delmar Ave.	77.8	606 N. Delmar Ave.	81.3	618 N. Delmar Ave.	122.7																
MP-030B	C	615 N. Delmar Ave.	27.1	610 N. Delmar Ave.	78.0	606 N. Delmar Ave.	81.4	618 N. Delmar Ave.	123.0																
MP-031A	A	128 W. Cherry St.	48.4	125 W. Cherry St.	49.1	125B W. Cherry St.	49.1	123 W. Cherry St.	52.8	121 W. Cherry St.	77.2	128B W. Cherry St.	77.0	119 W. Cherry St.	106.9	122 W. Cherry St.	110.3								
MP-031B	B	128 W. Cherry St.	46.3	125 W. Cherry St.	49.7	125B W. Cherry St.	49.7	123 W. Cherry St.	51.3	121 W. Cherry St.	74.6	128B W. Cherry St.	76.9	119 W. Cherry St.	104.0	122 W. Cherry St.	107.5								
MP-032A	B	118 W. Cherry St.	44.3	120 W. Cherry St.	46.1	115 W. Cherry St.	48.4	113 W. Cherry St.	54.2	117 W. Cherry St.	62.6	112 W. Cherry St.	65.3	122 W. Cherry St.	75.4	111 W. Cherry St.	75.8	119 W. Cherry St.	86.2	110 W. Cherry St.	91.1				
MP-032B	C	118 W. Cherry St.	44.3	120 W. Cherry St.	46.2	115 W. Cherry St.	48.3	113 W. Cherry St.	54.0	117 W. Cherry St.	62.6	112 W. Cherry St.	65.2	122 W. Cherry St.	75.5	111 W. Cherry St.	75.6	119 W. Cherry St.	86.3	110 W. Cherry St.	91.0				
MP-033A	A	112 W. Cherry St.	28.9	110 W. Cherry St.	34.8	118 W. Cherry St.	41.5	111 W. Cherry St.	47.1	113 W. Cherry St.	56.9	107 W. Cherry St.	58.8	106 W. Cherry St.	69.5	115 W. Cherry St.	78.7	105 W. Cherry St.	84.7	104 W. Cherry St.	95.2	120 W. Cherry St.	102.3	117 W. Cherry St.	117.4
MP-033B	B	112 W. Cherry St.	30.8	110 W. Cherry St.	39.0	118 W. Cherry St.	40.6	111 W. Cherry St.	44.6	113 W. Cherry St.	52.8	107 W. Cherry St.	59.2	106 W. Cherry St.	73.7	115 W. Cherry St.	74.4	105 W. Cherry St.	86.3	104 W. Cherry St.	99.3	120 W. Cherry St.	99.6	117 W. Cherry St.	113.1
MP-033C	C	112 W. Cherry St.	30.4	110 W. Cherry St.	38.8	118 W. Cherry St.	40.4	111 W. Cherry St.	44.9	113 W. Cherry St.	53.1	107 W. Cherry St.	59.4	106 W. Cherry St.	73.6	115 W. Cherry St.	74.6	105 W. Cherry St.	86.4	104 W. Cherry St.	99.2	120 W. Cherry St.	99.5	117 W. Cherry St.	113.2
MP-034A	B	100 W. Cherry St.	36.0	104 W. Cherry St.	41.3	106 W. Cherry St.	58.0	105 W. Cherry St.	62.4	518 N. Delmar Ave.	87.5	107 W. Cherry St.	89.4	516 N. Delmar Ave.	94.8	514 N. Delmar Ave.	111.3								
MP-034B	C	100 W. Cherry St.	27.4	104 W. Cherry St.	50.1	106 W. Cherry St.	69.3	105 W. Cherry St.	72.1	518 N. Delmar Ave.	75.7	107 W. Cherry St.	84.2	107 W. Cherry St.	100.7	516 N. Delmar Ave.	102.6								
MP-035A	A	518 N. Delmar Ave.	81.9	516 N. Delmar Ave.	91.9	514 N. Delmar Ave.	111.3	606 N. Delmar Ave.	151.5																
MP-035B	B	518 N. Delmar Ave.	85.5	516 N. Delmar Ave.	95.7	514 N. Delmar Ave.	115.2	606 N. Delmar Ave.	150.7																
MP-035C	C	518 N. Delmar Ave.	80.7	516 N. Delmar Ave.	91.4	514 N. Delmar Ave.	111.6	606 N. Delmar Ave.	148.2																

Table 1
ROST Response Area - EBMP Monitoring Probes Mapped to Addresses

Well	Zone	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist
MP-036A	B	101 E. Cherry St.	75.6																						
MP-036B	C	101 E. Cherry St.	76.9																						
MP-037A	B	107 E. Cherry St.	70.9	102 E. Cherry St.	116.8																				
MP-037B	C	107 E. Cherry St.	70.6	102 E. Cherry St.	116.6																				
MP-037C	C	107 E. Cherry St.	67.9	102 E. Cherry St.	113.6																				
MP-038A	B	504 N. Old St. Louis Rd.	16.8	128B W. Cherry St.	60.9	125 W. Date St.	66.8	500 N. Old St. Louis Rd.	79.4	123 W. Date St.	127.1														
MP-038B	C	504 N. Old St. Louis Rd.	17.1	128B W. Cherry St.	60.4	125 W. Date St.	69.1	500 N. Old St. Louis Rd.	79.3	123 W. Date St.	129.3														
MP-039A	B	111 W. Date St.	124.3	119 W. Date St.	128.8																				
MP-039B	C	111 W. Date St.	124.5	119 W. Date St.	129.0																				
MP-040A	B	507 N. Delmar Ave.	50.9	504 N. Delmar Ave.	56.9	102 W. Date St.	107.8	508 N. Delmar Ave.	132.8																
MP-040B	C	507 N. Delmar Ave.	51.0	504 N. Delmar Ave.	56.5	102 W. Date St.	108.1	508 N. Delmar Ave.	132.6																
MP-041A	B	101 E. Date St.	58.5	103 E. Date St.	77.3	107 E. Date St.	110.5	508 N. Delmar Ave.	126.8																
MP-041B	C	101 E. Date St.	58.7	103 E. Date St.	77.5	107 E. Date St.	110.8	508 N. Delmar Ave.	126.5																
MP-043A	A	128 W. Date St.	55.1	124 W. Date St.	55.6	123 W. Date St.	55.7	119 W. Date St.	66.7	122 W. Date St.	73.0	130 W. Date St.	78.6	500 N. Old St. Louis Rd.	93.3	125 W. Date St.	98.1	117 W. Date St.	103.1	116 W. Date St.	126.4				
MP-043B	B	128 W. Date St.	54.8	124 W. Date St.	55.8	123 W. Date St.	55.9	119 W. Date St.	67.1	122 W. Date St.	73.4	130 W. Date St.	78.3	500 N. Old St. Louis Rd.	93.0	125 W. Date St.	98.0	117 W. Date St.	103.6	116 W. Date St.	126.8				
MP-043C	C	128 W. Date St.	57.9	124 W. Date St.	58.5	123 W. Date St.	52.8	119 W. Date St.	65.0	122 W. Date St.	74.8	130 W. Date St.	80.8	500 N. Old St. Louis Rd.	91.2	125 W. Date St.	94.9	117 W. Date St.	101.9	116 W. Date St.	127.2				
MP-044A	A	102 E. Date St.	41.6	107 E. Date St.	43.0	103 E. Date St.	42.8	109 E. Date St.	54.0	101 E. Date St.	72.5	108 E. Date St.	103.8												
MP-044B	B	102 E. Date St.	39.4	107 E. Date St.	41.9	103 E. Date St.	48.8	109 E. Date St.	49.6	101 E. Date St.	78.8	108 E. Date St.	98.5												
MP-044C	C	102 E. Date St.	39.4	107 E. Date St.	41.8	103 E. Date St.	49.1	109 E. Date St.	49.3	101 E. Date St.	79.1	108 E. Date St.	98.4												
MP-045A	B	112 E. Date St.	38.9	117 E. Date St.	40.0	114 E. Date St.	43.2	119 E. Date St.	59.0	108 E. Date St.	73.8	109 E. Date St.	85.3	118 E. Date St.	94.8	102 E. Date St.	110.7								
MP-045B	C	112 E. Date St.	39.0	117 E. Date St.	39.8	114 E. Date St.	43.1	119 E. Date St.	58.8	108 E. Date St.	74.0	109 E. Date St.	85.4	118 E. Date St.	94.7	102 E. Date St.	110.9								
MP-046A	B	119 E. Date St.	43.4	118 E. Date St.	53.6	122 E. Date St.	68.5	117 E. Date St.	69.7	114 E. Date St.	74.0	112 E. Date St.	98.2												
MP-046B	C	119 E. Date St.	43.7	118 E. Date St.	53.3	122 E. Date St.	68.2	117 E. Date St.	69.9	114 E. Date St.	74.0	112 E. Date St.	98.2												
MP-047A	B	501 N. Olive St.	40.2	122 E. Date St.	110.8																				
MP-047B	C	501 N. Olive St.	40.0	122 E. Date St.	110.7																				
MP-048A	B	109 W. Elm St.	115.8	112 W. Date St.	121.4	116 W. Date St.	119.5	122 W. Date St.	132.9	121 W. Elm St.	144.8														
MP-048B	C	109 W. Elm St.	115.9	112 W. Date St.	121.3	116 W. Date St.	119.4	122 W. Date St.	132.9	121 W. Elm St.	145.0														
MP-049A	B	418 N. Delmar Ave.	39.1	102 W. Date St.	53.6	406 N. Delmar Ave.	78.7																		
MP-049B	C	418 N. Delmar Ave.	38.8	102 W. Date St.	53.5	406 N. Delmar Ave.	78.8																		
MP-051B	B	127 E. Elm St.	114.9	117 E. Elm St.	136.5																				
MP-051C	C	127 E. Elm St.	114.9	117 E. Elm St.	136.3																				
MP-052A	B	101 E. Elm St.	34.0	105 E. Elm St.	100.9																				
MP-052B	C	101 E. Elm St.	34.2	105 E. Elm St.	101.1																				
MP-053A	B	117 E. Elm St.	31.2	113 E. Elm St.	44.8	112 E. Elm St.	55.1	116 E. Elm St.	60.3	121 E. Elm St.	66.5	118 E. Elm St.	85.3	109 E. Elm St.	94.5	106 E. Elm St.	94.8	123 E. Elm St.	102.8	104 E. Elm St.	127.0				
MP-053B	C	117 E. Elm St.	31.1	113 E. Elm St.	44.6	112 E. Elm St.	55.2	116 E. Elm St.	60.5	121 E. Elm St.	66.6	118 E. Elm St.	85.5	109 E. Elm St.	94.4	106 E. Elm St.	94.8	123 E. Elm St.	102.9	104 E. Elm St.	126.9				
MP-054A	B	127 E. Elm St.	44.8	126 E. Elm St.	58.1	130 E. Elm St.	70.7	124 E. Elm St.	71.0	123 E. Elm St.	76.7	118 E. Elm St.	110.8	121 E. Elm St.	113.0										
MP-054B	C	127 E. Elm St.	44.8	126 E. Elm St.	58.0	130 E. Elm St.	70.7	124 E. Elm St.	70.9	123 E. Elm St.	76.7	118 E. Elm St.	110.7	121 E. Elm St.	112.9										
MP-055A	B	401 N. Olive St.	21.2	319 N. Olive St.	90.5																				
MP-055B	C	401 N. Olive St.	21.1	319 N. Olive St.	90.6																				
MP-056A	B	129 E. Forest St.	66.2	125 E. Forest St.	104.4	124 E. Elm St.	119.9	121 E. Forest St.	125.6	116 E. Elm St.	147.3														
MP-056B	C	129 E. Forest St.	66.2	125 E. Forest St.	104.3	124 E. Elm St.	120.0	121 E. Forest St.	125.4	116 E. Elm St.	147.2														
MP-057A	B	135 E. Forest St.	45.0	130 E. Forest St.	71.4	139 E. Forest St.	82.2																		
MP-057B	C	135 E. Forest St.	44.9	130 E. Forest St.	71.1	139 E. Forest St.	82.5																		
MP-058A	B	125 E. Watkins St.	66.6	122 E. Forest St.	105.6	116 E. Forest St.	123.6																		
MP-058B	C	125 E. Watkins St.	66.3	122 E. Forest St.	105.7	116 E. Forest St.	123.8																		
MP-059A	A	102 E. Forest St.	102.1																						
MP-059B	B	102 E. Forest St.	101.8																						
MP-060A	A	209 N. Olive St.	86.0																						
MP-060B	C	209 N. Olive St.	86.1																						
MP-064A	A	139 E. Watkins St.	40.4	142 E. Watkins St.	46.2	134 E. Watkins St.	86.8																		
MP-064B	C	139 E. Watkins St.	40.6	142 E. Watkins St.	45.9	134 E. Watkins St.	86.7																		
MP-077A	B	103 E. Forest St.	117.2	100 E. Elm St.	117.8	102 E. Elm St.	130.0	104 E. Elm St.	138.5																
MP-077B	C	103 E. Forest St.	117.4	100 E. Elm St.	117.6	102 E. Elm St.	129.9	104 E. Elm St.	138.4																
MP-078A	A	125B W. Birch St.	83.0																						
MP-078B	B	125B W. Birch St.	83.0																						
MP-078C	C	125B W. Birch St.	86.8																						
MP-079A	B	118 W. Birch St.	36.2	117 W. Birch St.	65.3	119 W. Birch St.	65.3	112 W. Birch St.	69.4	107 W. Birch St.	87.7	123 W. Birch St.	109.7												
MP-079B	C	118 W. Birch St.	36.1	117 W. Birch St.	65.1	119 W. Birch St.	65.1	112 W. Birch St.	69.6	107 W. Birch St.	87.9	123 W. Birch St.	109.5												
MP-080A	B	701 N. Delmar Ave.	44.8	700 N. Delmar Ave.	77.8	618 N. Delmar Ave.	80.4	610 N. Delmar Ave.	131.7	612 N. Delmar Ave.	142.7														

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Well	Zone	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist
MP-080B	C	701 N. Delmar Ave.	45.0	700 N. Delmar Ave.	77.9	618 N. Delmar Ave.	80.4	615 N. Delmar Ave.	131.5	610 N. Delmar Ave.	142.6														
MP-082A	B	214 N. Delmar Ave.	59.0	212 N. Delmar Ave.	110.9																				
MP-082B	C	214 N. Delmar Ave.	59.4	212 N. Delmar Ave.	111.3																				
MP-083A	B	610 N. Old St. Louis Rd.	35.2																						
MP-083B	C	610 N. Old St. Louis Rd.	35.1																						
MP-084A	A	318 N. Delmar Ave.	37.7	402 N. Delmar Ave.	72.5	404A N. Delmar Ave.	104.6	404B N. Delmar Ave.	104.6																
MP-084B	C	318 N. Delmar Ave.	37.6	402 N. Delmar Ave.	72.4	404A N. Delmar Ave.	104.6	404B N. Delmar Ave.	104.6																
MP-085A	B	619 N. Olive St.	83.8																						
MP-085B	C	619 N. Olive St.	84.0																						
MP-086A	A	301 N. Delmar Ave.	31.9	300 N. Delmar Ave.	59.4	310 N. Delmar Ave.	95.7																		
MP-086B	C	301 N. Delmar Ave.	31.8	300 N. Delmar Ave.	59.3	310 N. Delmar Ave.	95.8																		
MP-088A	A	116 E. Watkins St.	41.6	112 E. Watkins St.	49.1	119 E. Watkins St.	49.4																		
MP-088B	B	116 E. Watkins St.	41.6	112 E. Watkins St.	49.1	119 E. Watkins St.	49.4																		
MP-090AR	A	104 W. Elm St.	58.9	105 W. Elm St.	67.6	108 W. Elm St.	79.6																		
MP-090BR	B	104 W. Elm St.	58.9	105 W. Elm St.	67.6	108 W. Elm St.	79.6																		
MP-091A	A	109 W. Elm St.	45.1	116 W. Elm St.	50.1	118 W. Elm St.	62.3	108 W. Elm St.	88.3	105 W. Elm St.	90.2	121 W. Elm St.	112.2	122 W. Elm St	114.3	104 W. Elm St.	127.8	123 W. Elm St.	133.9						
MP-091B	B	109 W. Elm St.	44.9	116 W. Elm St.	50.5	118 W. Elm St.	62.5	108 W. Elm St.	88.6	105 W. Elm St.	90.1	121 W. Elm St.	112.0	122 W. Elm St	114.3	104 W. Elm St.	128.0	123 W. Elm St.	133.7						
MP-091C	C	109 W. Elm St.	45.0	116 W. Elm St.	54.5	118 W. Elm St.	61.6	108 W. Elm St.	93.7	105 W. Elm St.	92.9	121 W. Elm St.	106.9	122 W. Elm St	111.7	104 W. Elm St.	133.0	123 W. Elm St.	128.9						
MP-110D	C	111 W. Forest St.	46.1	112 W. Forest St.	46.6	107 W. Forest St.	52.2	114 W. Forest St.	58.8	115 W. Forest St.	74.2														
MP-110M	B	111 W. Forest St.	46.1	112 W. Forest St.	46.6	107 W. Forest St.	52.2	114 W. Forest St.	58.8	115 W. Forest St.	74.2														
MP-110S	A	111 W. Forest St.	46.1	112 W. Forest St.	46.6	107 W. Forest St.	52.2	114 W. Forest St.	58.8	115 W. Forest St.	74.2														
MP-114D	C	404A N. Delmar Ave.	47.5	404B N. Delmar Ave.	47.5	402 N. Delmar Ave.	78.1	406 N. Delmar Ave.	96.2																
MP-114M	B	404A N. Delmar Ave.	47.5	404B N. Delmar Ave.	47.5	402 N. Delmar Ave.	78.1	406 N. Delmar Ave.	96.2																
MP-114S	A	404A N. Delmar Ave.	47.5	404B N. Delmar Ave.	47.5	402 N. Delmar Ave.	78.1	406 N. Delmar Ave.	96.2																
MP-115D	C	418 N. Delmar Ave.	97.8	504 N. Delmar Ave.	125.4																				
MP-115S	A	418 N. Delmar Ave.	97.8	504 N. Delmar Ave.	125.4																				
MP-117M	C	102 E. Rand Ave.	73.7																						
MP-117S	B	102 E. Rand Ave.	73.7																						
MP-121M	C	107 E. Birch St.	37.0																						
MP-121S	B	107 E. Birch St.	37.0																						
MP-122M	B	619 N. Olive St.	74.5																						
MP-122S	A	619 N. Olive St.	74.5																						
MP-123D	C	617 N. Olive St.	47.4																						
MP-123M	B	617 N. Olive St.	47.4																						
MP-123S	A	617 N. Olive St.	47.4																						
MP-124D	C	617 N. Olive St.	92.9																						
MP-124M	B	617 N. Olive St.	92.9																						
MP-124S	A	617 N. Olive St.	92.9																						
MP-125D	C	107 E. Cherry St.	36.2	102 E. Cherry St.	97.3																				
MP-125M	B	107 E. Cherry St.	36.2	102 E. Cherry St.	97.3																				
MP-125S	A	107 E. Cherry St.	36.2	102 E. Cherry St.	97.3																				
MP-127D	B	501 N. Olive St.	36.4																						
MP-127M	B	501 N. Olive St.	36.4																						
MP-127S	A	501 N. Olive St.	36.4																						
MP-128M	C	409 N. Olive St.	60.0																						
MP-128S	A	409 N. Olive St.	60.0																						
MP-129M	C	405 N. Olive St.	36.1	409 N. Olive St.	53.0																				
MP-129S	B	405 N. Olive St.	36.1	409 N. Olive St.	53.0																				
MP-130D	C	215 N. Olive St.	45.0	213 N. Olive St.	59.5	138 E. Forest St.	88.1																		
MP-130M	B	215 N. Olive St.	45.0	213 N. Olive St.	59.5	138 E. Forest St.	88.1																		
MP-130S	A	215 N. Olive St.	45.0	213 N. Olive St.	59.5	138 E. Forest St.	88.1																		
MP-131M	C	209 N. Olive St.	103.8	201 N. Olive St.	118.9																				
MP-131S	B	209 N. Olive St.	103.8	201 N. Olive St.	118.9																				
MP-132M	C	201 N. Olive St.	90.0																						
MP-132S	B	201 N. Olive St.	90.0																						

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Well	Zone	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist
VMP-001D	B	707 N. Delmar Ave.	61.6	105 W. Birch St.	69.5	715 N. Delmar Ave.	109.1	720 N. Delmar Ave.	164.5																
VMP-001S	A	707 N. Delmar Ave.	61.6	105 W. Birch St.	69.5	715 N. Delmar Ave.	109.1	720 N. Delmar Ave.	164.5																
VMP-003	B	125B W. Birch St.	50.7																						
VMP-015D	C	309 N. Olive St.	71.5																						
VMP-015M	B	309 N. Olive St.	71.5																						
VMP-015VS	A	309 N. Olive St.	71.5																						
VMP-019D	C	101 W. Watkins St.	100.8																						
VMP-019M	B	101 W. Watkins St.	100.8																						
VMP-019S	A	101 W. Watkins St.	100.8																						
VMP-021D	C	129 W. Birch St.	48.3	125 W. Birch St.	83.2																				
VMP-021M	B	129 W. Birch St.	48.3	125 W. Birch St.	83.2																				
VMP-021S	A	129 W. Birch St.	48.3	125 W. Birch St.	83.2																				
VMP-026D	C	105 E. Watkins St.	34.3	104 E. Watkins St.	39.5	108 E. Watkins St.	41.0	102 E. Watkins St.	69.3	112 E. Watkins St.	79.1														
VMP-026M	B	105 E. Watkins St.	34.3	104 E. Watkins St.	39.5	108 E. Watkins St.	41.0	102 E. Watkins St.	69.3	112 E. Watkins St.	79.1														
VMP-026S	A	105 E. Watkins St.	34.3	104 E. Watkins St.	39.5	108 E. Watkins St.	41.0	102 E. Watkins St.	69.3	112 E. Watkins St.	79.1														
VMP-027D	C	121 W. Birch St.	35.6	123 W. Birch St.	35.6	117 W. Birch St.	66.6	119 W. Birch St.	66.6	125 W. Birch St.	70.2	118 W. Birch St.	98.2	125B W. Birch St.	108.4	129 W. Birch St.	115.2								
VMP-027M	B	121 W. Birch St.	36.1	123 W. Birch St.	36.1	117 W. Birch St.	68.9	119 W. Birch St.	68.9	125 W. Birch St.	68.3	118 W. Birch St.	100.5	125B W. Birch St.	107.7	129 W. Birch St.	112.9								
VMP-027S	A	121 W. Birch St.	36.1	123 W. Birch St.	36.1	117 W. Birch St.	68.9	119 W. Birch St.	68.9	125 W. Birch St.	68.3	118 W. Birch St.	100.5	125B W. Birch St.	107.7	129 W. Birch St.	112.9								
VMP-028M	B	701 N. Delmar Ave.	63.8	107 W. Birch St.	65.5	112 W. Birch St.	90.2	700 N. Delmar Ave.	134.2																
VMP-028S	A	701 N. Delmar Ave.	63.8	107 W. Birch St.	65.5	112 W. Birch St.	90.2	700 N. Delmar Ave.	134.2																
VMP-029M	B	142 E. Watkins St.	42.8	139 E. Watkins St.	48.8	134 E. Watkins St.	95.4																		
VMP-037D	C	130 W. Date St.	36.2	128 W. Date St.	63.0	124 W. Date St.	110.4																		
VMP-037M	B	130 W. Date St.	36.2	128 W. Date St.	63.0	124 W. Date St.	110.4																		
VMP-037S	A	130 W. Date St.	36.2	128 W. Date St.	63.0	124 W. Date St.	110.4																		
VMP-044D	C	125 W. Cherry St.	21.7	125B W. Cherry St.	21.7	123 W. Cherry St.	57.2	121 W. Cherry St.	97.6	128 W. Cherry St.	102.9														
VMP-044S	B	125 W. Cherry St.	21.7	125B W. Cherry St.	21.7	123 W. Cherry St.	57.2	121 W. Cherry St.	97.6	128 W. Cherry St.	102.9														
VMP-044VS	A	125 W. Cherry St.	21.7	125B W. Cherry St.	21.7	123 W. Cherry St.	57.2	121 W. Cherry St.	97.6	128 W. Cherry St.	102.9														
VMP-053S	B	800 N. Delmar Ave.	125.3																						
VMP-053VS	A	800 N. Delmar Ave.	125.3																						
VMP-058S	B	800A N. Delmar Ave.	84.3																						
VMP-058VS	A	800A N. Delmar Ave.	84.3																						
VMP-064M	B	507 N. Olive St.	65.3																						
VMP-064S	A	507 N. Olive St.	65.3																						
VMP-065M	C	405 N. Olive St.	66.4																						
VMP-065S	B	405 N. Olive St.	66.4																						
VMP-065VS	A	405 N. Olive St.	66.4																						
VMP-067M	C	108 W. Date St.	130.7																						
VMP-067S	B	108 W. Date St.	130.7																						
VMP-067VS	A	108 W. Date St.	130.7																						
VMP-068D	C	101 E. Elm St.	31.3	105 E. Elm St.	99.7	100 E. Elm St.	111.2	102 E. Elm St.	125.1	109 E. Elm St.	138.7														
VMP-068S	B	101 E. Elm St.	31.3	105 E. Elm St.	99.7	100 E. Elm St.	111.2	102 E. Elm St.	125.1	109 E. Elm St.	138.7														
VMP-068VS	A	101 E. Elm St.	31.3	105 E. Elm St.	99.7	100 E. Elm St.	111.2	102 E. Elm St.	125.1	109 E. Elm St.	138.7														
VMP-069D	C	300B N. Delmar Ave.	105.8	101 E. Forest St.	112.9																				
VMP-069M	B	300B N. Delmar Ave.	105.8	101 E. Forest St.	112.9																				
VMP-069VS	A	300B N. Delmar Ave.	105.8	101 E. Forest St.	112.9																				
VMP-070M	B	311 N. Olive St.	54.5	129 E. Forest St.	102.9	135 E. Forest St.	112.7																		
VMP-070VS	A	311 N. Olive St.	54.5	129 E. Forest St.	102.9	135 E. Forest St.	112.7																		

Table 1
ROST Response Area - EBMP Monitoring Probes Mapped to Addresses

Well	Zone	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist	Address	Dist
VMP-071M	C	313 N. Olive St.	60.4	315 N. Olive St.	60.4	311 N. Olive St.	123.6																		
VMP-071S	B	313 N. Olive St.	60.4	315 N. Olive St.	60.4	311 N. Olive St.	123.6																		
VMP-071VS	A	313 N. Olive St.	60.4	315 N. Olive St.	60.4	311 N. Olive St.	123.6																		
VMP-073D	C	214 N. Delmar Ave.	63.5	300 N. Delmar Ave.	80.6	219 N. Delmar Ave.	109.8	301 N. Delmar Ave.	110.8																
VMP-073M	B	214 N. Delmar Ave.	63.5	300 N. Delmar Ave.	80.6	219 N. Delmar Ave.	109.8	301 N. Delmar Ave.	110.8																
VMP-073S	A	214 N. Delmar Ave.	63.5	300 N. Delmar Ave.	80.6	219 N. Delmar Ave.	109.8	301 N. Delmar Ave.	110.8																
VMP-074D	C	101 E. Forest St.	44.2	103 E. Forest St.	73.4	105 E. Forest St.	97.2	300B N. Delmar Ave.	108.4	111 E. Forest St.	131.3														
VMP-074M	B	101 E. Forest St.	44.2	103 E. Forest St.	73.4	105 E. Forest St.	97.2	300B N. Delmar Ave.	108.4	111 E. Forest St.	131.3														
VMP-074VS	A	101 E. Forest St.	44.2	103 E. Forest St.	73.4	105 E. Forest St.	97.2	300B N. Delmar Ave.	108.4	111 E. Forest St.	131.3														
VMP-076M	C	138 E. Forest St.	59.6	139 E. Forest St.	91.6																				
VMP-076S	B	138 E. Forest St.	59.6	139 E. Forest St.	91.6																				
VMP-076VS	A	138 E. Forest St.	59.6	139 E. Forest St.	91.6																				
VMP-077D	C	210 N. Delmar Ave.	46.2	215 N. Delmar Ave.	54.1	202 N. Delmar Ave.	66.4	219 N. Delmar Ave.	79.1	205 N. Delmar Ave.	94.3	212 N. Delmar Ave.	95.6	206 N. Delmar Ave.	102.8	142 E. Watkins St.	108.3	200 N. Delmar Ave.	108.3						
VMP-077VS	A	210 N. Delmar Ave.	46.2	215 N. Delmar Ave.	54.1	202 N. Delmar Ave.	66.4	219 N. Delmar Ave.	79.1	205 N. Delmar Ave.	94.3	212 N. Delmar Ave.	95.6	206 N. Delmar Ave.	102.8	142 E. Watkins St.	108.3	200 N. Delmar Ave.	108.3						
VMP-078D	C	102 E. Forest St.	105.6	106 E. Forest St.	116.9	112 E. Forest St.	122.0	114 E. Forest St.	143.7																
VMP-078M	B	102 E. Forest St.	105.6	106 E. Forest St.	116.9	112 E. Forest St.	122.0	114 E. Forest St.	143.7																
VMP-078VS	A	102 E. Forest St.	105.6	106 E. Forest St.	116.9	112 E. Forest St.	122.0	114 E. Forest St.	143.7																
VMP-080D	C	101 E. Watkins St.	67.2																						
VMP-080S	B	101 E. Watkins St.	67.2																						
VMP-080VS	A	101 E. Watkins St.	67.2																						
VMP-081D	C	123 E. Watkins St.	27.9	120 E. Watkins St.	47.0	119 E. Watkins St.	55.3	122 E. Watkins St.	58.6	126 E. Watkins St.	93.0	125 E. Watkins St.	122.9												
VMP-081M	B	123 E. Watkins St.	27.9	120 E. Watkins St.	47.0	119 E. Watkins St.	55.3	122 E. Watkins St.	58.6	126 E. Watkins St.	93.0	125 E. Watkins St.	122.9												
VMP-081VS	A	123 E. Watkins St.	27.9	120 E. Watkins St.	47.0	119 E. Watkins St.	55.3	122 E. Watkins St.	58.6	126 E. Watkins St.	93.0	125 E. Watkins St.	122.9												
VMP-089S	B	101 E. Cherry St.	123.7																						
VMP-089VS	A	101 E. Cherry St.	123.7																						
VMP-093S	A	122 E. Date St.	57.2	119 E. Date St.	60.9	118 E. Date St.	60.1	114 E. Date St.	93.3																
VMP-094S	B	401 N. Olive St.	49.1	319 N. Olive St.	69.9	130 E. Elm St.	77.6	126 E. Elm St.	112.9																
VMP-094VS	A	401 N. Olive St.	49.1	319 N. Olive St.	69.9	130 E. Elm St.	77.6	126 E. Elm St.	112.9																
VMP-098VS	A	118 W. Birch St.	34.1	117 W. Birch St.	62.1	119 W. Birch St.	62.1	112 W. Birch St.	72.9	121 W. Birch St.	105.6	123 W. Birch St.	105.6												
VMP-099VS	A	701 N. Delmar Ave.	45.1	700 N. Delmar Ave.	74.9	618 N. Delmar Ave.	78.1	707 N. Delmar Ave.	110.4	610 N. Delmar Ave.	141.6														
VMP-101VS	A	610 N. Old St. Louis Rd.	31.6																						
VMP-102VS	A	318 N. Delmar Ave.	35.6	402 N. Delmar Ave.	70.3	404A N. Delmar Ave.	103.1	404B N. Delmar Ave.	103.1																
VMP-103VS	A	619 N. Olive St.	86.5																						
VMP-104VS	A	301 N. Delmar Ave.	33.0	300 N. Delmar Ave.	59.9	310 N. Delmar Ave.	93.6																		
VP-001	A	507 N. Olive St.	62.3																						
VP-004M	C	507 N. Olive St.	65.6																						
VP-004S	B	507 N. Olive St.	65.6																						

Note:
Dist = Distance
Work Product of Applied Geosciences, Inc.; February 6, 2009

Table 2
BUFFER ZONE - EBMP Monitoring Probes Mapped to Addresses

Well	Address	Dist (ft)	Address	Dist (ft)	Address	Dist (ft)	Address	Dist (ft)	Address	Dist (ft)	Address	Dist (ft)	Address	Dist (ft)	Address	Dist (ft)	Address	Dist (ft)
HMW-043A	115 N. Olive St.	67.7																
HMW-043B	115 N. Olive St.	68.6																
HMW-052A	103 N. Olive St.	81.4	115 N. Olive St.	121.4														
HMW-052B	103 N. Olive St.	82.7	115 N. Olive St.	117.5														
MP-061A	105 E. Maple St.	122.6																
MP-061B	105 E. Maple St.	122.6																
MP-062A	129 E. Maple St.	112.9	127 E. Maple St.	114.3														
MP-062B	129 E. Maple St.	112.7	127 E. Maple St.	114.2														
MP-063A	107 N. Olive St.	77.5	143 E. Maple St.	120.7														
MP-063B	107 N. Olive St.	71.8	143 E. Maple St.	111.6	141 E. Maple St.	119.3												
MP-065A	101 E. Hawthorne St.	43.1	105 E. Hawthorne St.	84.6														
MP-065B	101 E. Hawthorne St.	43.2	105 E. Hawthorne St.	84.7														
MP-089A	115 E. Maple St.	120.6	113 E. Maple St.	121.6	117 E. Maple St.	123.6												
MP-089B	115 E. Maple St.	120.6	113 E. Maple St.	121.6	117 E. Maple St.	123.6												
MP-092A	131 W. Elm St.	43.7	126 W. Elm St.	80.5														
MP-092B	131 W. Elm St.	43.9	126 W. Elm St.	80.3														
MP-092C	131 W. Elm St.	43.8	126 W. Elm St.	80.4														
MP-093A	146 E. Maple St.	51.0	143 E. Maple St.	78.1	142 E. Maple St.	83.4	103 N. Olive St.	101.0	19 N. Olive St.	101.5	140 E. Maple St.	113.4	107 N. Olive St.	114.7	141 E. Maple St.	116.8		
MP-093B	146 E. Maple St.	43.7	143 E. Maple St.	66.7	142 E. Maple St.	68.7	140 E. Maple St.	98.2	141 E. Maple St.	103.5	19 N. Olive St.	113.4	103 N. Olive St.	113.8	107 N. Olive St.	117.7		
MP-111D	119 W. Forest St.	30.1	122 W. Forest St.	64.5	124 W. Forest St.	79.4	125 W. Forest St.	86.3	128 W. Forest St.	121.3								
MP-111M	119 W. Forest St.	30.1	122 W. Forest St.	64.5	124 W. Forest St.	79.4	125 W. Forest St.	86.3	128 W. Forest St.	121.3								
MP-111S	119 W. Forest St.	30.1	122 W. Forest St.	64.5	124 W. Forest St.	79.4	125 W. Forest St.	86.3	128 W. Forest St.	121.3								
MP-132M	115 N. Olive St.	91.4																
MP-132S	115 N. Olive St.	91.4																
VMP-017M	15 N. Olive St.	79.3	19 N. Olive St.	94.8														
VMP-017S	15 N. Olive St.	79.3	19 N. Olive St.	94.8														
VMP-018D	100 E. Maple St.	45.3	105 E. Maple St.	47.4	104 E. Maple St.	69.1	107 E. Maple St.	73.8	106 E. Maple St.	94.5	109 E. Maple St.	111.8						
VMP-018M	100 E. Maple St.	45.3	105 E. Maple St.	47.4	104 E. Maple St.	69.1	107 E. Maple St.	73.8	106 E. Maple St.	94.5	109 E. Maple St.	111.8						
VMP-018S	100 E. Maple St.	45.3	105 E. Maple St.	47.4	104 E. Maple St.	69.1	107 E. Maple St.	73.8	106 E. Maple St.	94.5	109 E. Maple St.	111.8						
VMP-019D	102 W. Watkins St.	70.8	107 W. Watkins St.	89.7	109 W. Watkins St.	114.3	110 W. Watkins St.	119.9										
VMP-019M	102 W. Watkins St.	70.8	107 W. Watkins St.	89.7	109 W. Watkins St.	114.3	110 W. Watkins St.	119.9										
VMP-019S	102 W. Watkins St.	70.8	107 W. Watkins St.	89.7	109 W. Watkins St.	114.3	110 W. Watkins St.	119.9										
VMP-020D	133 W. Watkins St.	46.0	131 W. Watkins St.	56.6	125 W. Watkins St.	113.4												
VMP-020M	133 W. Watkins St.	46.0	131 W. Watkins St.	56.6	125 W. Watkins St.	113.4												

Table 2
BUFFER ZONE - EBMP Monitoring Probes Mapped to Addresses

Well	Address	Dist (ft)	Address	Dist (ft)	Address	Dist (ft)	Address	Dist (ft)	Address	Dist (ft)	Address	Dist (ft)	Address	Dist (ft)	Address	Dist (ft)	Address	Dist (ft)
VMP-020S	133 W. Watkins St.	46.0	131 W. Watkins St.	56.6	125 W. Watkins St.	113.4												
VMP-030D	100 N. Delmar Ave.	24.9	20 N. Delmar Ave.	69.1	104 N. Delmar Ave.	106.6												
VMP-030S	100 N. Delmar Ave.	24.9	20 N. Delmar Ave.	69.1	104 N. Delmar Ave.	106.6												
VMP-030VS	100 N. Delmar Ave.	24.9	20 N. Delmar Ave.	69.1	104 N. Delmar Ave.	106.6												
VMP-031D	129 E. Maple St.	39.8	128 E. Maple St.	51.9	126 E. Maple St.	54.0	130 E. Maple St.	66.7	127 E. Maple St.	70.2	137 E. Maple St.	80.6	123 E. Maple St.	91.9	136 E. Maple St.	110.5	118 E. Maple St.	124.3
VMP-031M	129 E. Maple St.	43.1	128 E. Maple St.	50.6	126 E. Maple St.	57.1	130 E. Maple St.	62.1	137 E. Maple St.	75.8	127 E. Maple St.	76.6	123 E. Maple St.	98.9	136 E. Maple St.	103.7		
VMP-031VS	129 E. Maple St.	39.8	128 E. Maple St.	51.9	126 E. Maple St.	54.0	130 E. Maple St.	66.7	127 E. Maple St.	70.2	137 E. Maple St.	80.6	123 E. Maple St.	91.9	136 E. Maple St.	110.5	118 E. Maple St.	124.3
VMP-032D	107 N. Olive St.	68.6	143 E. Maple St.	111.9	141 E. Maple St.	121.0												
VMP-032M	107 N. Olive St.	68.6	143 E. Maple St.	111.9	141 E. Maple St.	121.0												
VMP-032S	107 N. Olive St.	68.6	143 E. Maple St.	111.9	141 E. Maple St.	121.0												
VMP-033D	118 E. Maple St.	85.0	125 E. Hawthorne St.	122.7														
VMP-033M	118 E. Maple St.	85.0	125 E. Hawthorne St.	122.7														
VMP-033VS	118 E. Maple St.	85.0	125 E. Hawthorne St.	122.7														
VMP-039D	132 W. Elm St.	65.6																
VMP-039M	132 W. Elm St.	65.6																
VMP-039S	132 W. Elm St.	65.6																
VMP-042D	115 W. Maple St.	40.8	121 W. Maple St.	75.0	111 W. Maple St.	87.3	110 W. Maple St.	105.9										
VMP-042S	115 W. Maple St.	40.8	121 W. Maple St.	75.0	111 W. Maple St.	87.3	110 W. Maple St.	105.9										
VMP-042VS	115 W. Maple St.	40.8	121 W. Maple St.	75.0	111 W. Maple St.	87.3	110 W. Maple St.	105.9										
VMP-072D	130 W. Forest St.	55.2	136 W. Forest St.	61.0	127 W. Forest St.	61.3	135 W. Forest St.	67.2	138 W. Forest St.	79.2	128 W. Forest St.	86.8	125 W. Forest St.	104.0				
VMP-072M	130 W. Forest St.	55.2	136 W. Forest St.	61.0	127 W. Forest St.	61.3	135 W. Forest St.	67.2	138 W. Forest St.	79.2	128 W. Forest St.	86.8	125 W. Forest St.	104.0				
VMP-072S	130 W. Forest St.	55.2	136 W. Forest St.	61.0	127 W. Forest St.	61.3	135 W. Forest St.	67.2	138 W. Forest St.	79.2	128 W. Forest St.	86.8	125 W. Forest St.	104.0				
VMP-079D	122 W. Watkins St.	47.1	123 W. Watkins St.	50.1	125 W. Watkins St.	62.4	130 W. Watkins St.	66.1	115 W. Watkins St.	96.1	131 W. Watkins St.	119.0						
VMP-079M	122 W. Watkins St.	47.1	123 W. Watkins St.	50.1	125 W. Watkins St.	62.4	130 W. Watkins St.	66.1	115 W. Watkins St.	96.1	131 W. Watkins St.	119.0						
VMP-079VS	122 W. Watkins St.	47.1	123 W. Watkins St.	50.1	125 W. Watkins St.	62.4	130 W. Watkins St.	66.1	115 W. Watkins St.	96.1	131 W. Watkins St.	119.0						
VMP-083D	102 W. Maple St.	42.9	105 W. Maple St.	61.4	106 W. Maple St.	73.0	107 W. Maple St.	95.7	103 N. Delmar Ave.	97.5	108 W. Maple	99.5						
VMP-083M	102 W. Maple St.	42.9	105 W. Maple St.	61.4	106 W. Maple St.	73.0	107 W. Maple St.	95.7	103 N. Delmar Ave.	97.5	108 W. Maple	99.5						
VMP-083VS	102 W. Maple St.	42.9	105 W. Maple St.	61.4	106 W. Maple St.	73.0	107 W. Maple St.	95.7	103 N. Delmar Ave.	97.5	108 W. Maple	99.5						

Note:
Dist. = Distance
Work Product of Applied Geosciences, Inc.; February 6, 2009

DRAFT Work in Progress
Table 3
Residential Notification Status by Address

Property Address	Regional Location	Mitigation Measures Completed	Access Agreement in Place	Removed from the EMP	Notification Type		Opt-Out Address
					Telephone	Notice Card	
100 E. Elm St.	ROST Zone		X			X	
100 E. Maple St.	BUFFER ZONE		X			X	
100 N. Delmar Ave.	BUFFER ZONE					X	
100 W. Cherry St.	ROST Zone	Yes	X		X		
101 E. Birch St.	ROST Zone	Yes	X		X		
101 E. Cherry St.	ROST Zone					X	
101 E. Date St.	ROST Zone	Yes	X	1/20/2009		X	
101 E. Elm St.	ROST Zone					X	
101 E. Forest St.	ROST Zone	Yes	X		X		
101 E. Hawthorne St.	BUFFER ZONE	Yes	X	3/18/2009		X	
101 E. Watkins St.	ROST Zone	Yes	X		X		
101 W. Watkins St.	ROST Zone					X	
102 E. Cherry St.	ROST Zone					X	
102 E. Date St.	ROST Zone	Yes	X		X		
102 E. Elm St.	ROST Zone					X	
102 E. Forest St.	ROST Zone					X	
102 E. Rand Ave.	ROST Zone					X	
102 E. Watkins St.	ROST Zone					X	
102 W. Date St.	ROST Zone					X	
102 W. Maple St.	BUFFER ZONE					X	
102 W. Watkins St.	BUFFER ZONE					X	
103 E. Date St.	ROST Zone					X	
103 E. Forest St.	ROST Zone					X	
103 N. Delmar Ave.	BUFFER ZONE					X	
103 N. Olive St.	BUFFER ZONE	Yes	X		X		
104 E. Elm St.	ROST Zone					X	
104 E. Maple St.	BUFFER ZONE		X			X	
104 E. Watkins St.	ROST Zone					X	
104 N. Delmar Ave.	BUFFER ZONE					X	
104 W. Cherry St.	ROST Zone					X	
104 W. Elm St.	ROST Zone	Yes	X		X		
105 E. Elm St.	ROST Zone					X	
105 E. Forest St.	ROST Zone					X	
105 E. Hawthorne St.	BUFFER ZONE	Yes	X	3/18/2009		X	
105 E. Maple St.	BUFFER ZONE					X	
105 E. Watkins St.	ROST Zone	Yes	X	3/18/2009		X	
105 W. Birch St.	ROST Zone	Yes	X	1/20/2009		X	
105 W. Cherry St.	ROST Zone					X	
105 W. Elm St.	ROST Zone					X	
105 W. Maple St. ⁽¹⁾	BUFFER ZONE	Yes	X	3/12/2008 & 1/20/2009		X	
106 E. Birch St.	ROST Zone		X			X	
106 E. Elm St.	ROST Zone	Yes	X		X		
106 E. Forest St.	ROST Zone	Yes	X		X		
106 E. Maple St.	BUFFER ZONE	Yes	X	1/20/2009		X	
106 W. Cherry St.	ROST Zone					X	
106 W. Maple St.	BUFFER ZONE	Yes	X		X		
107 E. Birch St.	ROST Zone					X	
107 E. Cherry St.	ROST Zone					X	
107 E. Date St.	ROST Zone		X			X	
107 E. Maple St.	BUFFER ZONE	Yes	X	1/20/2009		X	
107 N. Olive St.	BUFFER ZONE		X			X	
107 W. Birch St.	ROST Zone	Yes	X		X		
107 W. Cherry St.	ROST Zone					X	
107 W. Forest St.	ROST Zone	Yes	X		X		
107 W. Maple St.	BUFFER ZONE					X	
107 W. Watkins St.	BUFFER ZONE	Yes	X		X		
108 E. Date St. Front	ROST Zone	Yes	X		X		
108 E. Date St. Rear	ROST Zone		X			X	
108 E. Watkins St.	ROST Zone					X	
108 W. Date St.	ROST Zone					X	
108 W. Elm St.	ROST Zone	Yes	X		X		
108 W. Maple St.	BUFFER ZONE		X			X	
109 E. Date St.	ROST Zone	Yes	X		X		
109 E. Elm St.	ROST Zone					X	
109 E. Maple St.	BUFFER ZONE					X	
109 W. Elm St.	ROST Zone					X	
109 W. Watkins St.	BUFFER ZONE					X	
110 W. Cherry St.	ROST Zone		X			X	
110 W. Maple St.	BUFFER ZONE					X	
110 W. Watkins St.	BUFFER ZONE					X	
111 E. Forest St.	ROST Zone		X			X	
111 W. Cherry St.	ROST Zone					X	

DRAFT Work in Progress

Table 3

Residential Notification Status by Address

Property Address	Regional Location	Mitigation Measures Completed	Access Agreement in Place	Removed from the EMP	Notification Type		Opt-Out Address
					Telephone	Notice Card	
111 W. Date St.	ROST Zone	Yes	X	1/20/2009		X	
111 W. Forest St.	ROST Zone	Yes	X		X		
111 W. Maple St.	BUFFER ZONE	Yes	X	1/20/2009		X	
112 E. Date St.	ROST Zone					X	
112 E. Elm St.	ROST Zone	Yes	X	1/20/2009		X	
112 E. Forest St.	ROST Zone					X	
112 E. Watkins St.	ROST Zone					X	
112 W. Birch St.	ROST Zone	Yes	X		X		
112 W. Cherry St.	ROST Zone		X			X	
112 W. Date St.	ROST Zone					X	
112 W. Forest St.	ROST Zone		X			X	
113 E. Elm St.	ROST Zone					X	
113 E. Maple St.	BUFFER ZONE		X			X	
113 W. Cherry St.	ROST Zone	Yes	X	1/20/2009		X	
114 E. Date St.	ROST Zone	Yes	X		X		
114 E. Forest St.	ROST Zone	Yes	X		X		
114 W. Forest St.	ROST Zone					X	
115 E. Maple St.	BUFFER ZONE	Yes	X		X		
115 N. Olive St.	BUFFER ZONE	Yes	X		X		
115 W. Cherry St.	ROST Zone					X	
115 W. Forest St.	ROST Zone					X	
115 W. Maple St.	BUFFER ZONE	Yes	X		X		
115 W. Watkins St.	BUFFER ZONE					X	
116 E. Elm St.	ROST Zone					X	
116 E. Forest St.	ROST Zone	Yes	X	1/20/2009		X	
116 E. Watkins St.	ROST Zone	Yes	X	1/20/2009		X	
116 W. Date St.	ROST Zone	Yes	X		X		
116 W. Elm St.	ROST Zone					X	
117 E. Date St.	ROST Zone	Yes	X		X		
117 E. Elm St.	ROST Zone	Yes	X		X		
117 E. Forest St.	ROST Zone	Yes	X	1/20/2009		X	
117 E. Maple St.	BUFFER ZONE	Yes	X	1/20/2009		X	
117 W. Birch St.	ROST Zone	Yes	X		X		
117 W. Cherry St.	ROST Zone					X	
117 W. Date St.	ROST Zone	Yes	X		X		
118 E. Date St.	ROST Zone	Yes	X		X		
118 E. Elm St.	ROST Zone	Yes	X		X		
118 E. Maple St.	BUFFER ZONE					X	
118 W. Birch St.	ROST Zone	Yes	X		X		
118 W. Cherry St.	ROST Zone	Yes	X		X		
118 W. Elm St.	ROST Zone		X			X	
119 E. Date St.	ROST Zone	Yes	X		X		
119 E. Watkins St.	ROST Zone		X			X	
119 W. Birch St.	ROST Zone	Yes	X		X		
119 W. Cherry St.	ROST Zone	Yes	X		X		
119 W. Date St.	ROST Zone	Yes	X		X		
119 W. Forest St.	BUFFER ZONE	Yes	X	1/20/2009		X	
120 E. Watkins St.	ROST Zone					X	
120 W. Cherry St.	ROST Zone	Yes	X	3/18/2009		X	
121 E. Elm St.	ROST Zone	Yes	X		X		
121 E. Forest St.	ROST Zone					X	
121 W. Birch St.	ROST Zone	Yes	X	1/20/2009		X	
121 W. Cherry St.	ROST Zone	Yes	X		X		
121 W. Elm St.	ROST Zone					X	
121 W. Maple St.	BUFFER ZONE					X	
122 E. Date St.	ROST Zone		X	3/18/2009		X	
122 E. Forest St.	ROST Zone	Yes	X	1/20/2009		X	
122 E. Watkins St.	ROST Zone					X	
122 W. Cherry St.	ROST Zone	Yes	X		X		
122 W. Date St.	ROST Zone	Yes	X		X		
122 W. Elm St.	ROST Zone					X	
122 W. Forest St.	BUFFER ZONE	Yes	X	1/20/2009		X	
122 W. Watkins St.	BUFFER ZONE	Yes	X		X		
123 E. Elm St.	ROST Zone	Yes	X		X		
123 E. Maple St.	BUFFER ZONE	Yes	X		X		
123 E. Watkins St.	ROST Zone	Yes	X		X		
123 W. Birch St.	ROST Zone	Yes	X	3/18/2009		X	
123 W. Cherry St.	ROST Zone	Yes	X		X		
123 W. Date St.	ROST Zone					X	
123 W. Elm St.	ROST Zone		X			X	
123 W. Watkins St.	BUFFER ZONE	Yes	X	1/20/2009		X	
124 E. Elm St.	ROST Zone					X	

DRAFT Work in Progress
Table 3
Residential Notification Status by Address

Property Address	Regional Location	Mitigation Measures Completed	Access Agreement in Place	Removed from the EMP	Notification Type		Opt-Out Address
					Telephone	Notice Card	
124 W. Date St.	ROST Zone	Yes	X	1/20/2009		X	
124 W. Forest St.	BUFFER ZONE	Yes	X	1/20/2009		X	
125 E. Forest St.	ROST Zone	Yes	X		X		
125 E. Hawthorne St.	BUFFER ZONE					X	
125 E. Watkins St.	ROST Zone					X	
125 W. Birch St.	ROST Zone	Yes	X	3/18/2009		X	
125 W. Birch St. Rear	ROST Zone	Yes	X	1/20/2009		X	
125 W. Cherry St.	ROST Zone					X	
125B W. Cherry St.	ROST Zone					X	
125 W. Date St.	ROST Zone					X	
125 W. Forest St.	BUFFER ZONE	Yes	X		X		
125 W. Watkins St.	BUFFER ZONE	Yes	X	1/20/2009		X	
126 E. Elm St.	ROST Zone	Yes	X		X		
126 E. Maple St.	BUFFER ZONE	Yes	X	1/20/2009		X	
126 E. Watkins St.	ROST Zone	Yes	X		X		
126 W. Elm St.	BUFFER ZONE	Yes	X	3/18/2009		X	
127 E. Elm St.	ROST Zone					X	
127 E. Maple St.	BUFFER ZONE		X			X	
127 W. Forest St.	BUFFER ZONE	Yes	X	3/18/2009		X	
128 E. Maple St.	BUFFER ZONE					X	
128 W. Cherry St.	ROST Zone	Yes	X		X		
128 W. Cherry St. Rear	ROST Zone	Yes	X	1/20/2009		X	
128 W. Date St.	ROST Zone	Yes	X		X		
128 W. Forest St.	BUFFER ZONE	Yes	X	1/20/2009		X	
129 E. Forest St.	ROST Zone					X	
129 E. Maple St.	BUFFER ZONE		X			X	
129 W. Birch St.	ROST Zone	Yes	X		X		
130 E. Elm St.	ROST Zone					X	
130 E. Forest St.	ROST Zone		X			X	
130 E. Maple St.	BUFFER ZONE		X			X	
130 E. Watkins St.	ROST Zone	Yes	X		X		
130 W. Date St.	ROST Zone	Yes	X		X		
130 W. Forest St.	BUFFER ZONE					X	
130 W. Watkins St.	BUFFER ZONE	Yes	X	1/20/2009		X	
131 W. Elm St.	BUFFER ZONE	Yes	X	2/5/2009		X	
131 W. Watkins St.	BUFFER ZONE		X	1/20/2009		X	
132 W. Elm St.	BUFFER ZONE					X	
133 W. Watkins St.	BUFFER ZONE	Yes	X		X		
134 E. Watkins St.	ROST Zone	Yes	X	1/20/2009		X	
135 E. Forest St. (2)	ROST Zone	Yes	X	12/18/2007			
135 W. Forest St.	BUFFER ZONE		X			X	
136 E. Maple St.	BUFFER ZONE		X			X	
136 W. Forest St.	BUFFER ZONE					X	
137 E. Maple St.	BUFFER ZONE					X	
138 E. Forest St.	ROST Zone					X	
138 W. Forest St.	BUFFER ZONE	Yes	X		X		
139 E. Forest St.	ROST Zone	Yes	X		X		
139 E. Watkins St.	ROST Zone					X	
140 E. Maple St.	BUFFER ZONE					X	
141 E. Maple St.	BUFFER ZONE	Yes	X	1/20/2009		X	
142 E. Maple St.	BUFFER ZONE	Yes	X	1/20/2009		X	
142 E. Watkins St.	ROST Zone	Yes	X	1/20/2009		X	
143 E. Maple St.	BUFFER ZONE	Yes	X		X		
146 E. Maple St.	BUFFER ZONE					X	
15 N. Olive St.	BUFFER ZONE					X	
19 N. Olive St.	BUFFER ZONE	Yes	X	1/20/2009		X	
20 N. Delmar Ave.	BUFFER ZONE					X	
200 N. Delmar Ave.	ROST Zone	Yes	X	3/18/2009		X	
201 N. Olive St.	ROST Zone	Yes	X		X		
202 N. Delmar Ave.	ROST Zone					X	
205 N. Delmar Ave.	ROST Zone		X			X	
206 N. Delmar Ave.	ROST Zone					X	
209 N. Olive St.	ROST Zone					X	
210 N. Delmar Ave.	ROST Zone	Yes	X		X		
212 N. Delmar Ave.	ROST Zone	Yes	X		X		
213 N. Olive St.	ROST Zone					X	
214 N. Delmar Ave.	ROST Zone	Yes	X	1/20/2009		X	
215 N. Delmar Ave.	ROST Zone	Yes	X	1/20/2009		X	
215 N. Olive St.	ROST Zone		X			X	
219 N. Delmar Ave.	ROST Zone					X	
300 N. Delmar Ave.	ROST Zone					X	
300 N. Delmar Ave. Rear	ROST Zone	Yes	X	1/20/2009		X	

DRAFT Work in Progress
Table 3
Residential Notification Status by Address

Property Address	Regional Location	Mitigation Measures Completed	Access Agreement in Place	Removed from the EMP	Notification Type		Opt-Out Address
					Telephone	Notice Card	
301 N. Delmar Ave.	ROST Zone	Yes	X	1/20/2009		X	
309 N. Olive St.	ROST Zone	Yes	X		X		
310 N. Delmar Ave.	ROST Zone	Yes	X		X		
311 N. Olive St.	ROST Zone	Yes	X		X		
313 N. Olive St.	ROST Zone	Yes	X		X		
315 N. Olive St.	ROST Zone	Yes	X		X		
318 N. Delmar Ave.	ROST Zone	Yes	X		X		
319 N. Olive St.	ROST Zone					X	
401 N. Olive St.	ROST Zone	Yes	X		X		
402 N. Delmar Ave.	ROST Zone					X	
404A N. Delmar Ave.	ROST Zone					X	
404B N. Delmar Ave.	ROST Zone					X	
405 N. Olive St.	ROST Zone					X	
406 N. Delmar Ave.	ROST Zone					X	
409 N. Olive St.	ROST Zone	Yes	X	1/20/2009		X	
418 N. Delmar Ave.	ROST Zone					X	
500 N. Old St. Louis Rd.	ROST Zone	Yes	X	1/20/2009		X	
501 N. Olive St.	ROST Zone					X	
504 N. Delmar Ave.	ROST Zone	Yes	X		X		
504 N. Old St. Louis Rd.	ROST Zone					X	
507 N. Delmar Ave.	ROST Zone					X	
507 N. Olive St.	ROST Zone	Yes	X		X		
508 N. Delmar Ave.	ROST Zone					X	
514 N. Delmar Ave.	ROST Zone		X			X	
516 N. Delmar Ave.	ROST Zone	Yes	X		X		
518 N. Delmar Ave.	ROST Zone	Yes	X		X		
606 N. Delmar Ave.	ROST Zone	Yes	X	1/20/2009		X	
610 N. Delmar Ave.	ROST Zone	Yes	X		X		
610 N. Old St. Louis Rd.	ROST Zone	Yes	X		X		
615 N. Delmar Ave.	ROST Zone					X	
617 N. Olive St.	ROST Zone					X	
618 N. Delmar Ave.	ROST Zone					X	
619 N. Olive St.	ROST Zone	Yes	X		X		
700 N. Delmar Ave.	ROST Zone	Yes	X	1/20/2009		X	
701 N. Delmar Ave.	ROST Zone					X	
707 N. Delmar Ave.	ROST Zone					X	
715 N. Delmar Ave/HCC	ROST Zone	Yes	X		X		
720 N. Delmar Ave.	ROST Zone					X	
800 N. Delmar Ave.	ROST Zone					X	
800A N. Delmar Ave.	ROST Zone					X	

Notes:

- (1) March 12, 2008 Agencies provided verbal approval; January 20, 2009 written approval by Agencies.
- (2) Activity was suspended and approved by Agencies on 12/18/2007. No Notification is required.

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Table 4

TO-15 & ASTM D-1946 Analytes and Reporting Limits

Compound	Indoor Air Reporting Limits (ug/m ³)	Sub-Slab Reporting Limits (ug/m ³)
1,3-Butadiene	2.0	20
n-Hexane	200	2,000
Benzene	10	100
Methylcyclohexane	3,000	30,000
Toluene	300	3,000
m&p-Xylene	217	2,170
o-Xylene	217	2,170
Isopentane	115	1,150
n-Butane	115	1,150
1,3,5-Trimethylbenzene	6.0	60
1,2,4-Trimethylbenzene	6.0	60
Methane	N/A	N/A
Carbon dioxide	N/A	N/A
Oxygen	N/A	N/A

Notes:

ug/m³ = microgram per meter cubed

NA = not applicable

DRAFT – Work in Progress

Table 5
Comparison Values (CVs)

Compound	Indoor Air ($\mu\text{g}/\text{m}^3$)^(a)	Sub-Slab Vapor ($\mu\text{g}/\text{m}^3$)
1,3-Butadiene	2	20
n-Hexane	200	2,000
Benzene - chronic	10	100
Benzene – acute	29	290
Methylcyclohexane	3,000	30,000
Toluene	300	3,000
Total Xylenes ^(b)	217	2170
Total Trimethylbenzenes ^(b)	6	60
Isopentane ^(c)	115	1,150
n-Butane ^(c)	115	1,150

Notes:

- (a) Indoor air CVs (ATSDR and IDPH, June 16, 2006).
- (b) CVs are for isomer totals.
- (c) CVs are not health based.

Draft Work in Progress
Table 6

RESIDENTIAL EVENT-BASED MONITORING DECISION TREE
(for locations where mitigation measures have been conducted)

On specified sampling schedule, collect sub-slab depressurization system (SSDS) sub-slab monitoring port (SSMP) vacuum readings, air extraction flow rates and vapor samples or sub-slab vapor samples and indoor air summa canister samples from residences and analyze samples. Identify samples with sub-slab vapor and indoor air concentrations above comparison values (CVs).

1. Does the residence have an SSDS in place and are sampling results available?
 - a. Yes. Go to 15.
 - b. No. Go to 2.
2. Are indoor air sampling data available?
 - a. Yes. Go to 3.
 - b. No. Go to 12.
3. Are sub-slab vapor sampling data available?
 - a. Yes. Go to 4.
 - b. No. Go to 11.
4. Are sub-slab vapor concentrations above CVs?
 - a. Yes. Go to 5.
 - b. No. Go to 9.
5. Are sub-slab vapor concentrations for benzene above 290 µg/m³?
 - a. Yes. Home to be placed on a weekly sampling schedule. Go to 8.
 - b. No. Go to 6.
6. Are indoor air concentrations above CVs?
 - a. Yes. Notify the Agencies. Implement Contingency Plan as appropriate. Compare sub-slab vapor and indoor air concentrations for each detected compound. Go to 7.
 - b. No. Resample home on a monthly schedule (except if sub-slab vapor concentrations above 290 µg/m³, use weekly schedule).
7. Are all compounds present in indoor air absent in sub-slab vapor samples?
 - a. Yes. Resample home on a monthly schedule (except if sub-slab vapor concentrations above 290 µg/m³, use weekly schedule). Optional residence specific evaluation to determine source of compounds.
 - b. No. Conduct residence specific evaluation that includes determining the potential contribution of the compounds from other sources and the integrity of mitigation measures at the residence. Resample home on a monthly schedule (except if sub-slab vapor concentrations above 290 µg/m³, use weekly schedule).
8. Are indoor air concentrations for benzene above 29 µg/m³ and also present in sub-slab?
 - a. Yes. Notify the Agencies. Implement Contingency Plan as appropriate. Conduct residence specific evaluation that includes determining the potential contribution of benzene from other sources and the integrity of mitigation measures at the residence. Resample home on a weekly schedule.
 - b. No. Go to 6.
9. Are indoor air concentrations above CVs?
 - a. Yes. Notify the Agencies. Compare sub-slab vapor and indoor air concentration for each detected compound. Go to 10.
 - b. No. Go to 25.
10. Are all compounds present in indoor air absent in sub-slab vapor samples?
 - a. Yes. Go to 25.
 - b. No. Conduct site specific evaluation that includes determining the potential contribution of the compounds from other sources and the integrity of mitigation measures at the site. Continue sampling home on specified schedule. Go to 26.
11. Are indoor air concentrations above CVs?

- a. Yes. Notify the Agencies. Install sub-slab monitoring ports and sample sub-slab soil gases, if possible. Conduct residence specific evaluation that includes determining the potential contribution of the compounds from other sources and the integrity of mitigation measures at the residence. Resample indoor air after removing identified indoor air sources. Evaluate regional system data and effectiveness. Consider collecting near-slab soil gas data. Implement Contingency Plan as appropriate.
 - b. No. If possible, sample sub-slab soil gas. Go to 25.
- 12. Are sub-slab vapor sampling data available?
 - a. Yes. Go to 13.
 - b. No. Make every reasonable effort to gain access and conduct mitigation and monitoring efforts. Continue sampling home on schedule.
- 13. Are sub-slab vapor concentrations above comparison values (CVs)?
 - a. Yes. Go to 14.
 - b. No. Collect indoor air samples pending access. Go to 25.
- 14. Are sub-slab vapor concentrations for benzene above 290 µg/m³?
 - a. Yes. Make immediate effort to gain access and sample indoor air and resample sub-slab vapors. Resample on weekly schedule.
 - b. No. Make immediate effort to gain access and sample indoor air and resample sub-slab vapors. Resample on monthly schedule.

SSDS

- 15. Have SSDS SSMP for vacuum criteria been achieved at all SSMP (minimum of 0.05 inches of water)?
 - a. Yes. Go to 16.
 - b. No. Evaluate SSDS performance and repair as necessary/possible. Go to 16.
- 16. Are indoor air sampling data available?
 - a. Yes. Go to 17.
 - b. No. Go to 22.
- 17. Are indoor air concentrations above CVs?
 - a. Yes. Notify the Agencies. Implement Contingency plan as appropriate. Go to 18.
 - b. No. Go to 20.
- 18. Are sub-slab vapor sampling data available?
 - a. Yes. Compare sub-slab vapor and indoor air concentrations for each detected compound. Go to 19.
 - b. No. Collect sub-slab soil gas sample. Conduct residence specific evaluation that includes determining the potential contribution of the compounds from other sources and the integrity of mitigation measures at the residence. Resample indoor air after removing identified indoor air sources. Evaluate regional system data and effectiveness. Consider collecting near-slab soil gas data. Check SSDS operation. Go to 15.
- 19. Are all compounds present in indoor air absent in sub-slab vapor samples?
 - a. Yes. Optional residence specific evaluation to determine source of compounds. Go to 25.
 - b. No. Conduct residence specific evaluation that includes determining the potential contribution of the compounds from other sources and the integrity of mitigation measures at the residence. Confer with Agencies for sampling schedule. Go to 26.
- 20. Are sub-slab vapor sampling data available?
 - a. Yes. Go to 21.
 - b. No. Sample sub-slab soil gas. Continue sampling home on quarterly schedule. Go to 25.
- 21. Are sub-slab vapor concentrations above CVs?
 - a. Yes. Evaluate potential for vapor intrusion and integrity of mitigation measures at the residence. Check SSDS operation. Continue sampling home on quarterly schedule. Go to 26.
 - b. No. Go to 25.
- 22. Are sub-slab vapor sampling data available?

- a. Yes. Go to 23.
 - b. No. Make every reasonable effort to gain access and take samples and evaluate mitigation measures. Continue sampling home on quarterly schedule.
- 23. Are sub-slab vapor concentrations above CVs?
 - a. Yes. Go to 24.
 - b. No. Collect indoor air samples pending access. Go to 25.
- 24. Are sub-slab vapor concentrations for benzene above 290 ug/m3?
 - a. Yes. Make immediate effort to gain access and sample indoor air and resample sub-slab vapors. Resample on weekly schedule.
 - b. No. Make immediate effort to gain access and sample indoor air and resample sub-slab vapors. Resample on monthly schedule.

Agency Review for Discontinuation of Monitoring

- 25. Have four quarters of data been collected without exceeding any sub-slab vapor CVs and indoor air CVs (with the exception of indoor air CVs that show no contribution from the site ('Yes' response in step 10 or step 19, or 'No' response in step 9)) and/or sub-slab vapor or indoor air sampling results are not available?
 - a. Yes. Submit data for Agency review for possible discontinuation of monitoring. Continue sampling at specified frequency pending decision.
 - b. No. Continue sampling home on specified schedule.
- 26. Have four quarters of data been collected without exceeding any sub-slab vapor CVs and indoor air CVs (with the exception of indoor air CVs that show no contribution from the site as discussed with the Agencies ('No' response in step 10 or 19 or 'Yes' response in step 21)) and/or sub-slab vapor or indoor air sampling results are not available?
 - a. Yes. Submit data for Agency review for possible discontinuation of monitoring. Continue sampling at specified frequency pending decision.
 - b. No. Continue sampling home on specified schedule.

Figures

INTERPRETED EXTENT OF ROST RESPONSE
(ALL STRATA) - CLAYTON DISSOLVED PHASE
GROUNDWATER INVESTIGATION REPORT,
JANUARY 2006

DRAFT - WORK-IN-PROGRES

Figure



0 125 250 500 Feet

**EVENT-BASED
MONITORING PROBE LOCATIONS
ZONES A, B, & C
HARTFORD, ILLINOIS**

AECOM

Prepared for:
Hartford Working Group
Hartford, Illinois

Date: February 11, 2009

Project Number: 01007-530

INTERPRETED EXTENT OF ROST RESPONSE
(ALL STRATA) - CLAYTON DISSOLVED PHASE
GROUNDWATER INVESTIGATION REPORT,
JANUARY 2006



BUFFER ZONE

Figure



A horizontal scale bar with tick marks at 0, 125, 250, and 500 feet. The word "Feet" is written at the right end of the bar.

**EVENT-BASED
MONITORING PROBE LOCATIONS
ZONE A DATA POINTS
HARTFORD, ILLINOIS**

AECOM

Prepared for:
Hartford Working Group
Hartford, Illinois

Date: February 11, 2009

Project Number: 01007-530

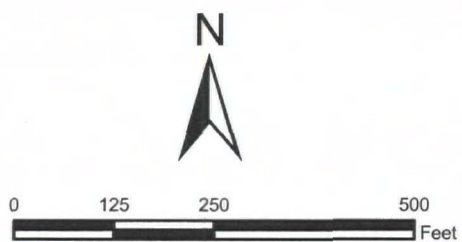
INTERPRETED EXTENT OF ROST RESPONSE
(ALL STRATA) - CLAYTON DISSOLVED PHASE
GROUNDWATER INVESTIGATION REPORT,
JANUARY 2006

DRAFT - WORK-IN-PROGRESS

15
VWIR-0303
BUFFER ZONE

1-2

Figure



EVENT-BASED MONITORING PROBE LOCATIONS ZONE B DATA POINTS HARTFORD, ILLINOIS

AECOM

Prepared for:
Hartford Working Group
Hartford, Illinois

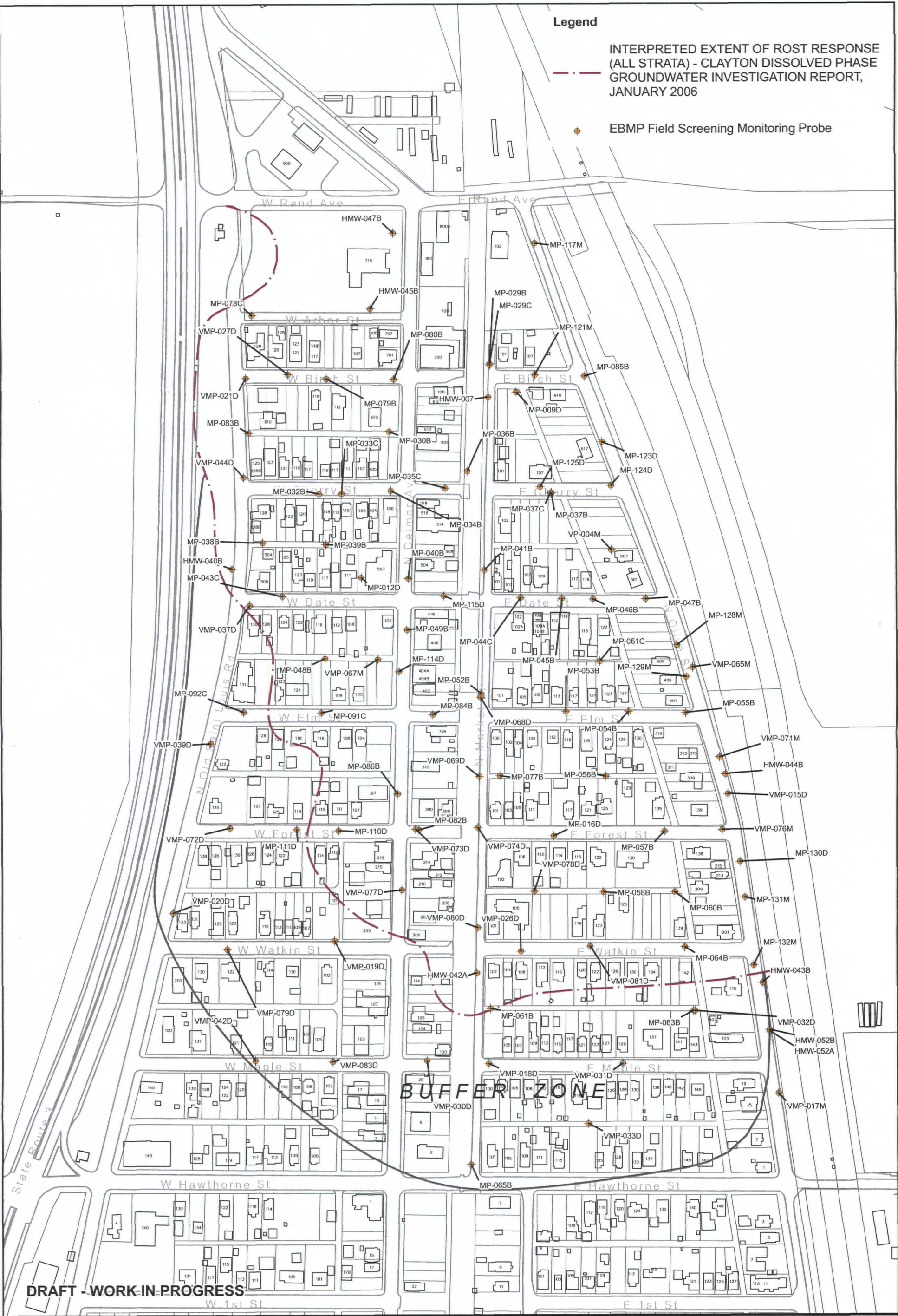
Date: February 11, 2009

Project Number: 01007-530

Legend

INTERPRETED EXTENT OF ROST RESPONSE
(ALL STRATA) - CLAYTON DISSOLVED PHASE
GROUNDWATER INVESTIGATION REPORT,
JANUARY 2006

EBMP Field Screening Monitoring Probe



DRAFT - WORK-IN-PROGRESS

BUFFER ZONE

1-3

Figure



0 125 250 500 Feet

EVENT-BASED
MONITORING PROBE LOCATIONS
ZONE C DATA POINTS
HARTFORD, ILLINOIS

AECOM

Prepared for:
Hartford Working Group
Hartford, Illinois

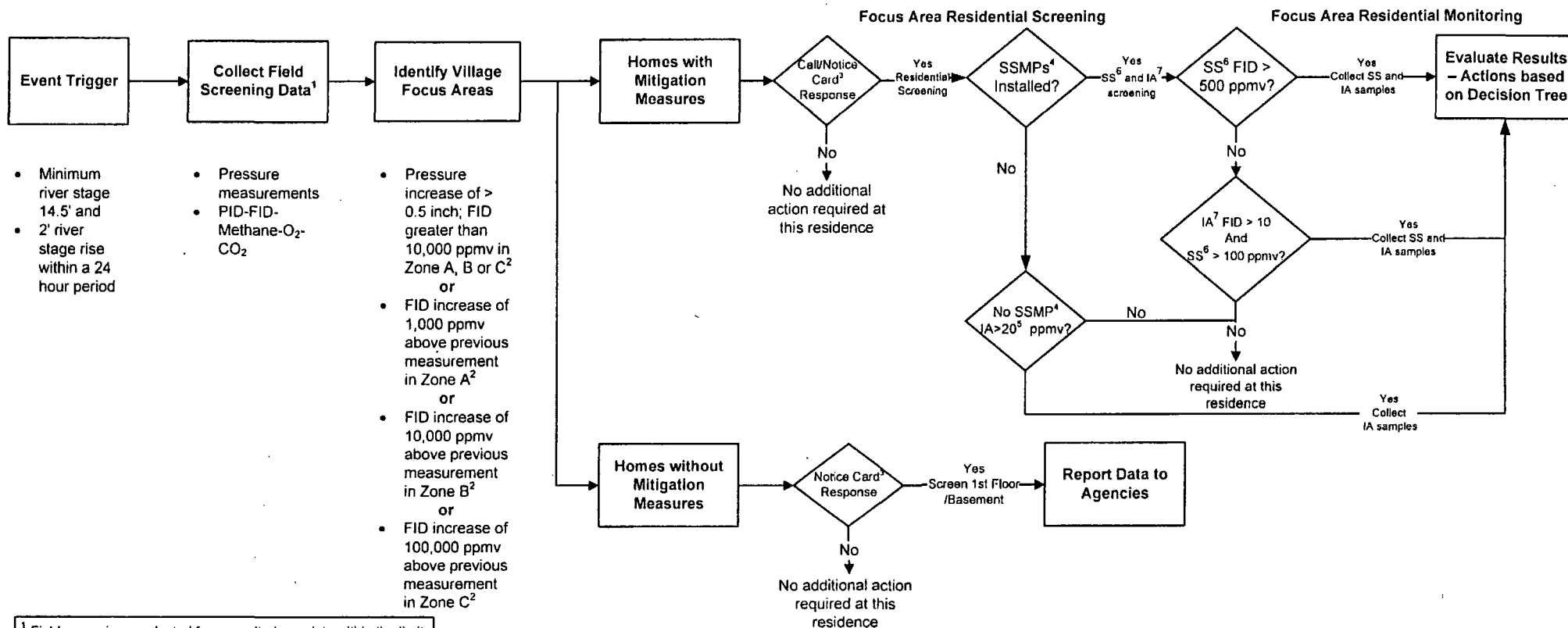
Date: February 11, 2009

Project Number: 01007-530

Figure 2 Draft Event Based Monitoring Plan (EBMP) Flow Chart

Draft Work in Progress

Transition from Effectiveness Monitoring Program (EMP) to EBMP



¹ Field screening conducted from monitoring points within the limit of ROST response and, at the Agencies discretion, up to three monitoring locations within the Buffer Zone.

² Zone A - 0 to 10 feet below ground surface (bgs); Zone B - >10 to 20 feet bgs; Zone C > 20 to 30 feet bgs.

³ Notice Cards delivered to residences located inside the est. limit of ROST response that do not have mitigation measures or were removed from the EMP and are located within approximately 125' of monitoring points exceeding focus area trigger.

⁴ SSMP = sub-slab monitoring ports.

⁵ > 20 in basement sample of the property if present.

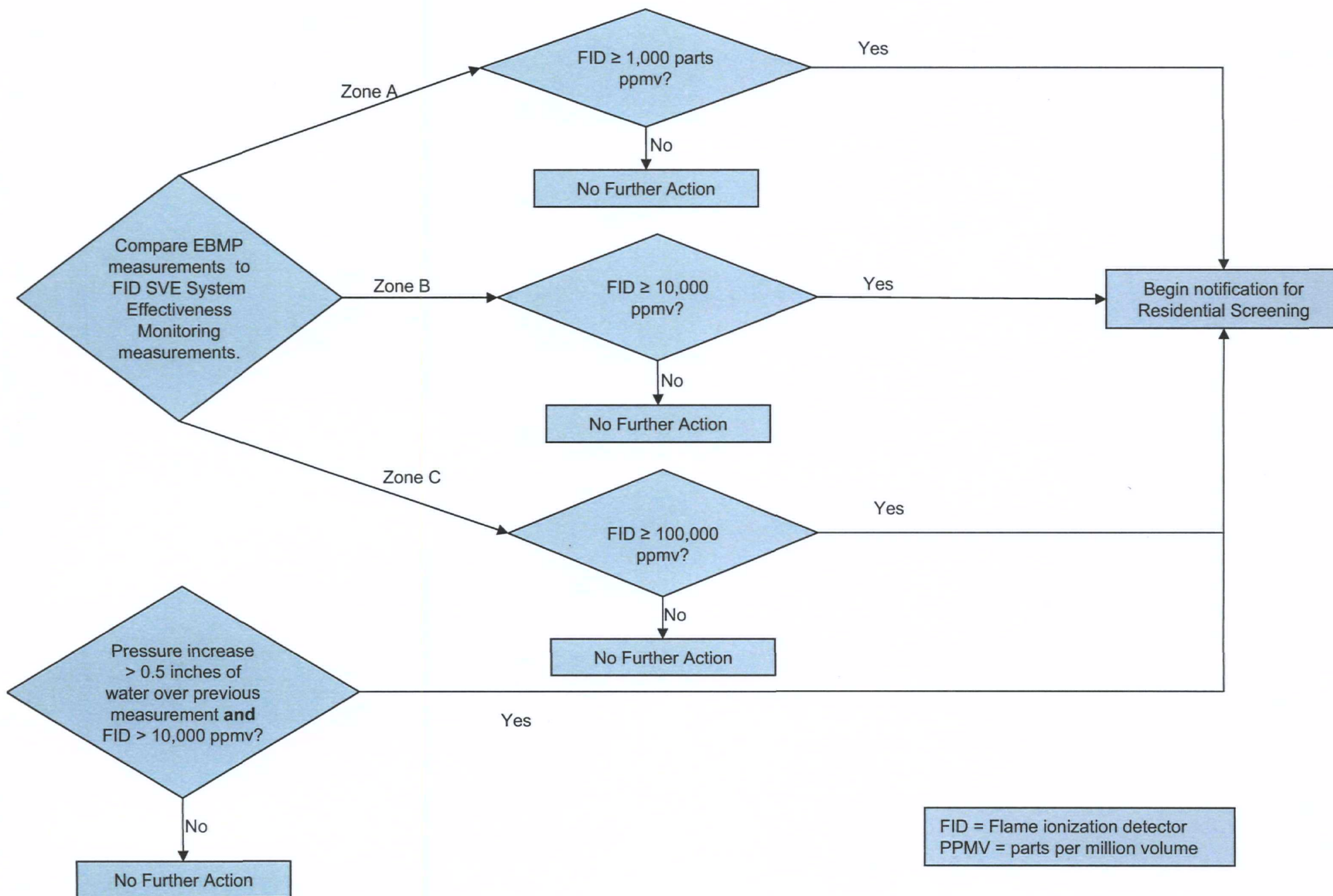
⁶ SS = Sub-slab.

⁷ IA = Indoor air.

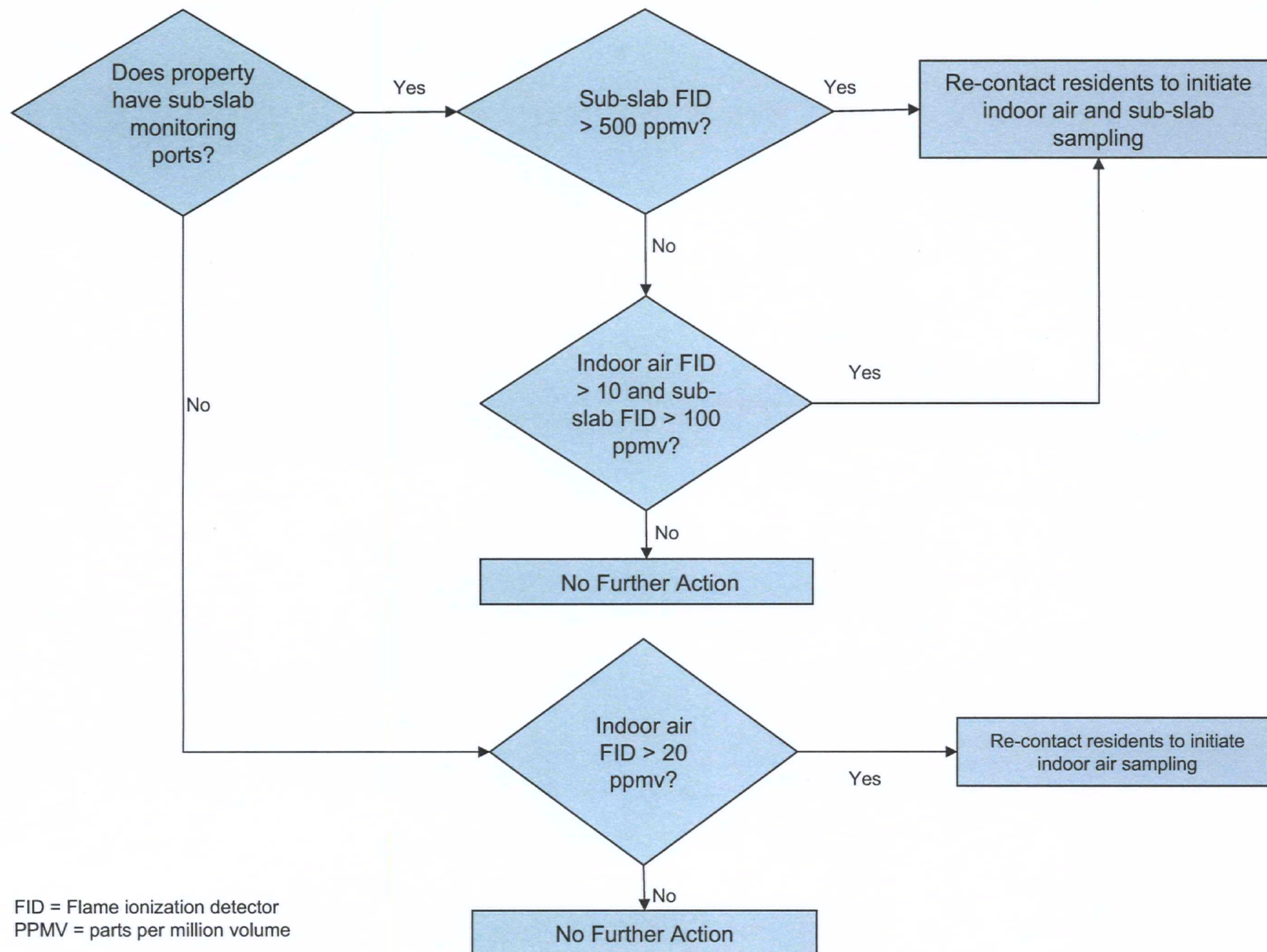
Agency Rollout of EBMP Program

- Village communication of change from EMP to EBMP
- Opportunity for residences to opt in/out of EBMP
 - o Opt-out residents = no future contact
 - o Non-responders = follow-up by IEPA

Figure 3
Event-Based Monitoring Probe Screening Thresholds



**Figure 4 Addresses With
Mitigation Measures - Residential Screening Thresholds**



Attachment A

Contingency Plan dated April 1, 2008

HARTFORD WORKING GROUP CONTINGENCY PLAN

(Revised April 1, 2008)

Effective Date: To Be Determined

I. PURPOSE

The Hartford Working Group (HWG) developed this Contingency Plan to summarize how the HWG will address petroleum vapor complaints made by the residents, local officials, businesses and other property owners (e.g., churches) of Hartford, Illinois (the Site as defined in the Administrative Order on Consent (AOC)). The Hartford Fire Department will have the lead in responding to complaints and determining if it is necessary to evacuate residents due to hazardous situations. The Illinois Environmental Protection Agency (IEPA) may also be contacted to determine if evacuation is necessary. If the Hartford Fire Department is not available to respond to a complaint made by a resident of Hartford, then, as appropriate, the South Roxana or the Wood River Fire Department may respond to a complaint (responding Fire Department). This Contingency Plan is not intended to address any complaints other than those petroleum vapor complaints made by residents of Hartford, as defined above.

II. EMERGENCY RESPONSE PROCEDURES

a. Notification

- i. Hartford residents that experience potential vapor intrusion issues in their homes should first notify the Fire Department by calling **911**.
- ii. If the responding Fire Department believes that the vapors may be caused by subsurface hydrocarbons being addressed by the HWG, the Fire Department will notify PM & Associates, who serves as the HWG single point of contact for citizen's complaints, and the Illinois Environmental Protection Agency (IEPA). PM & Associates will notify IEPA whenever an odor complaint is received from a resident or through notification from the Hartford Fire department.
- iii. PM & Associates will notify the HWG and ENSR's on-call representative.
- iv. The IEPA Collinsville, Illinois Office can be contacted Monday through Friday 8:30 a.m. to 5:00 p.m. at (618) 346-5120. After hours, weekends and holidays the IEPA can be contacted through the Illinois Emergency Management Agency at (800) 782-7860 [(217) 782-7860 if out of state]. The IEPA will contact the Illinois Department of Public Health (IDPH), which only has normal business-hour response capability, and the United States Environmental Protection Agency (USEPA) On-Scene Coordinator (OSC).

HARTFORD WORKING GROUP CONTINGENCY PLAN

(Revised April 1, 2008)

vapors being addressed by the HWG, PM & Associates will arrange for temporary lodging and meals per paragraph c.

- v. The Agencies and/or responding Fire Department will collectively determine when evacuated residents can return to their homes. The Agencies and responding Fire Department will collectively make determinations based on PID/FID readings, CGI readings, or other data collected by the Agencies or representatives of the HWG.

c. Alternative Lodging Arrangements and Cost of Meals

- i. If residents are evacuated due to what is believed to be petroleum vapors as described above, PM & Associates, on behalf of the HWG, will make arrangements and pay for temporary lodging at local hotels. PM & Associates will also reimburse residents for meals.

d. HWG Evaluation

- i. PM & Associates will notify both the HWG and ENSR when residents are evacuated due to petroleum vapors and when residents choose not to evacuate their homes. The decision to evacuate a resident will trigger completion of a Needs Assessment and actions to mitigate vapors, if access can be obtained. If a resident chooses not to evacuate their home, the HWG will attempt to work with the resident to mitigate petroleum vapor issues and to conduct a Needs Assessment.

- ii. ENSR will determine if a Needs Assessment was previously conducted at the subject residence and the status from any activities following that Needs Assessment.

-- If a Needs Assessment has not been conducted, ENSR will conduct a Needs Assessment (pending a grant of access to the residence) within 24 hours of either an evacuation or the resident choosing not to evacuate, whichever occurs. In addition, a temporary ventilation system will be installed within 24 to 48 hours of the notice to evacuate in order to reduce the potential for petroleum vapors.

-- If a Needs Assessment has been conducted and a vapor mitigation system was not installed, ENSR will conduct another Needs Assessment (pending a grant of access to the residence) to obtain additional data within 24 hours of either an evacuation or the resident choosing not to evacuate, whichever occurs. In addition, a temporary ventilation system will be installed within 24 to 48 hours of the notice to evacuate to reduce the potential for petroleum vapors.

-- If a vapor mitigation system has been installed, ENSR will conduct a Needs Assessment and system evaluation within 24 hours of either an evacuation or the residents choosing not to evacuate, whichever occurs (pending a grant of access to the residence). The purpose of the system evaluation will be to determine what measures can be taken, if any, to improve the mitigation system effectiveness. If measures are identified that can be taken to improve an existing system, and approval by the

HARTFORD WORKING GROUP CONTINGENCY PLAN

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Item	Quantity
TVA-1000 PID/FID	2
Combustible Gas Indicator	2
Calibration Gases	As appropriate
Summa Canisters	10
Personal Protective Equipment	As appropriate

- ii. The following equipment has been provided to the Hartford Fire Department by the HWG.

Item	Quantity
Ventilation Fans	2
Honda Generator	1
Combustible Gas Indicator (CGI)	2
Chargers for CGI	2
Flexible Exhaust Ducts for Fans	2
Heavy Duty Extension Cords	2

III. MAJOR MILESTONES

- a. When the HWG is required to take response action under this plan, within 24 hours or less, the HWG will begin necessary response actions consistent with this plan, and any necessary approvals may be oral. As soon as practicable, but in no event later than 48 hours after the HWG is required to take action under this plan, all temporary actions taken and planned, as described in this plan, will be reduced to writing and submitted to the USEPA OSCs as a written response plan. This written response plan shall be in the form of an email or a letter (if conveyed by facsimile), and shall include a description of any oral approvals received as well as a schedule of response actions. EPA shall review the written response plan and either approve,

HARTFORD WORKING GROUP CONTINGENCY PLAN

(Revised April 1, 2008)

Information to be provided to the Hotel
<ul style="list-style-type: none">• Resident's Name
<ul style="list-style-type: none">• Resident's address and telephone number
<ul style="list-style-type: none">• Purchase Order number provided by P/M & Associates

Addendum to Hartford Area Hydrocarbon Site Contingency Plan

Added 12/20/04; ¹Modified 4/1/08

Sewer monitoring is conducted at three manholes along W. Arbor Street (between N. Old St. Louis and N. Delmar Avenue) following a rainfall of 1.5 inches (or more) over a 24-hour period¹. If 25% of the Lower Explosive Limit (LEL) is measured within a sewer during monitoring activities, the following steps will be taken by the HWG or its representatives.

1. The HWG will inform the Hartford Fire Department and the Illinois Environmental Protection Agency of the LEL measurement.
The IEPA's contact number from 8:30 - 5:00 M-F is 618/346-5120. After hours and on weekends contact the Illinois Emergency Management Agency at 800/782-7860 (in Illinois only) from outside Illinois 217/782-7860.
2. The sewer in question will be tested with petroleum detection paste to determine if free-phase petroleum product is present.
3. A liquid sample will be taken, if possible, from the sewer in question for analysis.
4. A sewer vapor sample will be taken from the sewer in question.
5. Adjacent sewers up and downstream of the sewer in question will be monitored and sampled in a similar manner.
6. The sewer in question will be blocked off from traffic and vented until the LEL is reduced to below 10%.

HARTFORD WORKING GROUP CONTINGENCY PLAN

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HARTFORD WORKING GROUP CONTINGENCY PLAN CONTACT LIST

Primary Contact	Mobile/Pager	Office Phone	Fax
ENSR on-call representative	(618) 410-0649 (618) 410-4875	(618) 344-1545	(618) 343-1820
PM & Associates	(314) 280-3768 (314) 280-1578	(314) 367-8082	--
Hartford Working Group - URS	(314) 378-3262	(314) 743-4106	(314) 429-0462
IEPA - Collinsville Office	--	(618) 346-5120	(618) 346-5155
Illinois Emergency Management Agency (IEMA)	(800) 782-7860 (217) 782-7860 (out of state)		--
USEPA - Kevin Turner	(618) 525-3665	(618) 977-0115	(618) 988-0425
USEPA - Steve Faryan	(312) 802-0507	(312) 353-9351	--
Illinois Department of Public Health	--	(618) 656-6680	(618) 656-5863

Attachment B

Option Not to Participate in EBMP Agreement

DRAFT

Option Not to Participate in the EBMP Agreement - for Village of Hartford Residents

Request for removal from Hartford Event-Based Monitoring Program

In coordination with USEPA, Illinois EPA, and Illinois Department of Public Health, the Hartford Working Group conducts monitoring throughout the northern part of Hartford following a rapid rise in Mississippi River stage level. That monitoring includes screening of indoor air and sub-slab monitoring ports (SSMPs) at homes and businesses on certain streets in the Village. This monitoring program has replaced the previous quarterly monitoring program conducted in homes and businesses in the Village.

By signing this form, the property owner is stating that he or she does not want the property listed below included in Hartford Event-Based Monitoring Program and fully understands that the Hartford Working Group will no longer conduct indoor air or SSMP sampling at this property.

If, in the future, the property owner decides to participate in the program and wants the property included in future monitoring, he or she can enroll in the free monitoring program by contacting Robert Miner toll-free at 1-888-974-8379 or AECOM (ENSR) at 618-251-5140.

Address of property to be removed from monitoring program:

Name of Property Owner _____

Address (if different from above) _____

Phone number: _____

Attachment C

Event Definition Analysis dated April 1, 2008

Memorandum

Date: April 1, 2008
To: The Hartford Working Group
From: Patrick Haskell
Subject: Event Definition Analysis

Distribution: R. Mooshegian M. Degner C. Joss R. Veenstra

ENSR recently completed an analysis of potential event definitions based on Mississippi River stage and the historical incidence of odor complaints and fires (herein collectively referred to as complaints) in the Village of Hartford, Illinois. This analysis resulted in the following new definition of an event:

- After the river stage has risen above 14.5 feet (410 NGVD), an event shall be declared to have occurred for purposes of initiating event-based monitoring when an increase in the river stage exceeds two feet in a 24-hour period.

This memorandum documents the data and methods used in this analysis and the new definition approved by the Agencies during the March 12, 2008 conference call between the Hartford Working Group (HWG) and the Agencies. This definition of event is being incorporated into the revised Event-Based Monitoring Program (EBMP).

Prior Event Definition Analyses

The August 6, 2007 draft EBMP included a definition of an event which was based on the Mississippi River stage crossing certain fixed benchmarks. This definition was developed based on an analysis of hydrological and meteorological data and odor complaint data from 1990 through 2005. These analyses were documented in the Time Series Analysis memorandum (ENSR, September 25, 2006), and included a qualitative and quantitative evaluation of correlations between complaints (1990 through 2005) and the following data:

- Mississippi River stage data, as measured at the Lock and Dam 26 at Alton, Illinois tailwater gauging station ;
- Precipitation, daily mean temperature, barometric pressure, and wind speed, and daily predominant wind direction, as measured at Lambert-St. Louis International Airport;
- Field screening data from five sewer vapor monitoring locations (2004 & 2005 only);
- Groundwater elevation gauging data, measured remotely at three site monitoring well clusters (2004 & 2005 only); and
- Subsurface pressure data, as measured remotely at four site monitoring wells (2005 only).

The Time Series Analysis identified clear correlations between river stage and the incidence of complaints, and less consistent correlations between precipitation and odor complaints. Other parameters were either not correlated or were not characterized by sufficiently large datasets to identify correlations.

Based on this analysis, complaints occurred most frequently 3 to 7 days after an event. Therefore, an eight-day monitoring period, beginning on the same day that an event occurs was considered¹. Additionally, based on the results of the event definition analysis, it was determined that definitions based on changes in river stage captured a higher percentage of complaints. Table 1 summarizes the results of analyzing various rates of river stage increases at multiple initial river elevations, over an 8-day monitoring period. Based on a review of these data, the new event definition (i.e., a 2 foot/day increase after river stage is already at 410 feet NGVD) was developed; resulting in a 61% capture rate of historical complaints.

At the Agencies request, ENSR analyzed the capture efficiency of the new definition during complaint clusters (i.e., periods of time when multiple complaints occurred within a relatively short time period). For purposes of this analysis, a cluster was defined as a period of time wherein three or more complaints occurred within five days. The beginning and end of each cluster was defined as being bounded by five-day, complaint-free periods of time. However, due to this definition of a cluster, some clusters are as long as a month or more because no period of five complaint-free days occurred during that period of time. This analysis indicates that the capture efficiency of the new definition increases to 70% during complaint clusters. The complaint clusters that were missed were cases where 3 or more complaints occurred on a single day, with only one such cluster being more than one day in length. Based on the increased rate of complaint capture during complaint clusters, it was concluded that the new definition is effective for the purposes of event-based monitoring.

1 A modified sampling approach which incorporates the eight-day monitoring period is under development with representatives of the Agencies. The residential and regional monitoring program as described in the August 6, 2007 draft Event-Based Monitoring Program will remain in effect until the modified sample approach is approved by the Agencies.

Attachment D

Regional SVE System Effectiveness Monitoring Standard Operating Procedure (HWG SOP 02)

STANDARD OPERATING PROCEDURES

Title of SOP: Regional Effectiveness Monitoring
Site Location: Hartford, Illinois

HWG SOP No.: 02
Revision: 0
Date: July 2008

1.0 INTRODUCTION

The purpose of this Standard Operating Procedure (SOP) is to provide a consistent methodology for the collection of soil vapor samples at the Hartford Hydrocarbon Plume Site (site). Whenever possible, the samples collected throughout the Hartford will be screened on the same day of collection. If same-day screening is not possible due to time constraints, instrument problems, etc, the samples will be screened within 24-hours of sample collection. This SOP details the necessary procedures to follow so that representative samples are collected. These procedures are applicable to any soil vapor sample collected at the site. Important uses of these data include:

- Soil vapor extraction (SVE) system performance evaluation
- Mitigation measures effectiveness monitoring
- Evaluation of sub-slab VOC concentrations
- Hydrocarbon plume definition

2.0 REQUIRED MATERIALS FOR SAMPLE COLLECTION

- Dwyer Series 475 Mark III Digital manometer (ranges 0-10; 0-20; 0-40; and 0-200 inches of water)
- 1-liter Tedlar™ bags
- Tygon™ or silicone tubing cut to length
- ¼-inch O.D. Teflon, Polyethylene, or PVC tubing, cut to length
- Peristaltic pump
- Calibrated rotometer
- 60-mL syringe
- Stainless-steel manual pump
- Clean expandable adapters for connection of sampling apparatus to MP wells
- Crescent wrench (or equivalent hand tools)
- Solinst Model 101 Water Level Indicator or equivalent
- Solinst Model Mini 102 Water Level Indicator or equivalent
- Solinst Model 122 Interface Probe or equivalent
- Clean (dedicated) 3/16-Inch hose barb, chrome-plated brass, non-valved, in-line, female coupling body (herein referred to as "coupling body")
- New or dedicated 4-way valves for purging and sampling

STANDARD OPERATING PROCEDURES

Title of SOP: Regional Effectiveness Monitoring
Site Location: Hartford, Illinois

HWG SOP No.: 02
Revision: 0
Date: July 2008

Purging MP monitoring locations requires the use of a stainless-steel hand pump in conjunction with silicone (or equivalent) tubing and a dedicated coupling body. The hand pump should be tested prior to each sampling event by attaching a 1-liter Tedlar® test bag to the hand pump outlet. The inlet of the hand pump shall remain open to atmosphere. Two strokes of a properly working hand pump should fill a 1-liter bag to approximately 75-percent of capacity. The 1-liter bag should not be completely filled because the bags are typically oversized in order to allow for expansion of the sample during shipment, storage, etc. The hand pump should be rebuilt in accordance with manufacturer specifications if the hand pump fails to adequately fill the test bag.

The vacuum side of the hand pump shall be attached to a dedicated coupling body using silicone (or equivalent) tubing. The dedicated coupling body shall then be connected to the coupling insert located on the expandable well cap (for MP wells with PVC well risers) or located at the tip of the nylon riser tubing (for MP wells with nylon well risers), which will allow for the removal of purge volumes from the well. The purged volume is expelled to atmosphere from the positive side of the hand pump with every downward stroke of the pump handle (piston). Every upward stroke of the pump handle should remove approximately ½-liter of the purge volume from the well. Care must be taken to fully extend the hand pump handle on each pump stroke to ensure that the appropriate volume is removed from the well. When the minimum designated purge volume has been removed from the well (well purge volume is specified on the data collection field forms), the coupling body shall be disconnected from the coupling insert, which closes the well to atmosphere.

5.0 WELL SAMPLING

Upon completion of well purging soil vapor sample collection using Tedlar® sample media may commence. If water and/or product are encountered during sample collection, this observation shall be documented on the "additional comments" portion of the appropriate field form. Note, samples which indicate the presence of water and/or product shall not be analyzed.

Tedlar® Bag Samples

Air samples for on-site screening shall be collected using a Tedlar® bag and a peristaltic pump. For VMP monitoring locations, the peristaltic pump is attached to a 4-way plastic micro valve using a combination of Tygon® and silicone (or equivalent) tubing. For PVC monitoring wells, the peristaltic pump is attached to the dedicated coupling body using a combination of Tygon® and silicone (or equivalent) tubing. This also applies to monitoring wells with nylon well risers. The outlet of the peristaltic pump shall be attached to the inlet side of the flow calibrator (or rotometer) using a combination of Tygon® and silicone (or equivalent) tubing. Prior to flow-rate adjustment and sample collection, the sample identification, date, time of initial vacuum reading, and initial vacuum/pressure reading (if applicable) shall be clearly marked on the Tedlar® bag.

Flow Rate Adjustment

The rotometer shall be used to adjust the flow rate of the peristaltic pump to allow a flow rate of approximately 200 mL/minute. For VMP wells, this adjustment shall be performed by: 1) configuring the micro valve to allow for sample removal from the well; 2) observe the flow rate indicated by the ball height; and, 3) adjusting the peristaltic pump to allow a flow rate of approximately 200-mL/minute. For MP wells this adjustment shall be performed by: 1) connecting the coupling body to the coupling insert to allow for sample removal from the well; 2) observe the flow rate indicated by the ball height; and, 3) adjusting the peristaltic pump to allow a flow rate of approximately 200-mL/minute. *Notes: It is important*

STANDARD OPERATING PROCEDURES

Title of SOP: Regional Effectiveness Monitoring
Site Location: Hartford, Illinois

HWG SOP No.: 02
Revision: 0
Date: July 2008

is removed (turn counter-clockwise until it is removed) from the tip of the nylon well riser for 15 minutes after Tedlar® collection.

7.0 WATER/PRODUCT LEVEL MEASUREMENT

Due to their construction, VMP wells are not measured for water/product level. For MP monitoring locations with PVC well risers, a liquid-level measurement shall be obtained using either a Solinst 122 Interface Probe (or equivalent) for wells with a history of measurable product, or a Solinst 101 water level meter (or equivalent). For MP monitoring locations with nylon well risers, a liquid-level measurement will be obtained using a Solinst Mini 102 water level indicator. Prior to obtaining the measurement, the expandable well cap (for wells with PVC risers) or the coupling body (for wells with nylon risers) shall be removed and the well vented for 15 minutes. Field forms will indicate the appropriate equipment to use for a given sample location. The depth to water and/or product shall be recorded on the field forms. Replace the well cap or coupling body after obtaining the measurement.

If a measurement can not be obtained, the field forms shall reflect the field condition with the notation "NM" for not measured, and this observation and explanation shall be documented in the "additional comments" portion of the field form. If measurement can be made, but no water and/or product is present, the field forms shall reflect the field condition with the notation "NE" for not encountered.

For wells with product, non-dedicated, reusable equipment shall be cleaned / decontaminated after each use using the following steps:

- Perform initial equipment cleaning using isopropanol (wipe tape and probe with isopropanol soaked paper towel);
- Additional alconox and water solution wash;
- De-ionized water rinse;
- Final isopropanol wipe; and
- Allow equipment to air dry.

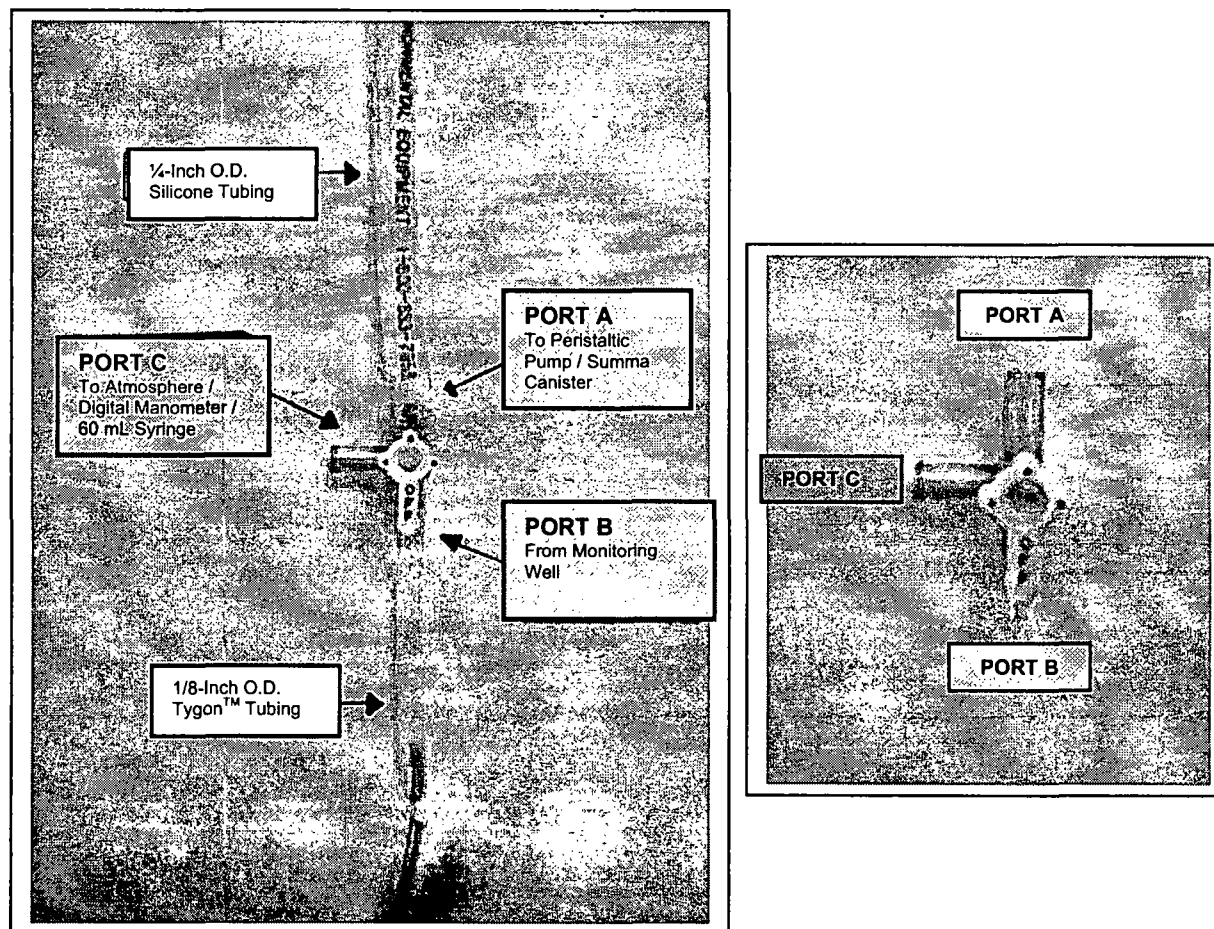
For well locations without product, the decontamination procedure as outlined above shall be followed, however the initial isopropanol cleaning is not required.

8.0 FINAL (STABILIZED) VACUUM/PRESSURE MEASUREMENT

A pressure is considered to be stabilized when it does not fluctuate more than 5% in one minute. The manometer shall be allowed a maximum of thirty (30) minutes to stabilize before the vacuum/pressure is recorded. If the manometer does not stabilize within the 30-minute period, the range in which the vacuum/pressure fluctuates over an additional one (1) minute period will be documented on the "additional comments" portion of the appropriate field form. The highest reading observed within the additional one (1) minute period will be recorded on the main portion of the appropriate field form. *(Please note: If the manometer reading fluctuates between two vacuums, the lowest/weakest vacuum observed will be recorded on the main portion of the field form. If the manometer reading fluctuates between a vacuum and a pressure, the highest pressure observed will be recorded on the main portion of the field form. If the manometer reading fluctuates between two pressures, the highest/strongest pressure*

ATTACHMENT A
GUIDE TO THE 4-WAY MICRO-VALVE

Valve Position #1: Closed to Monitoring Well



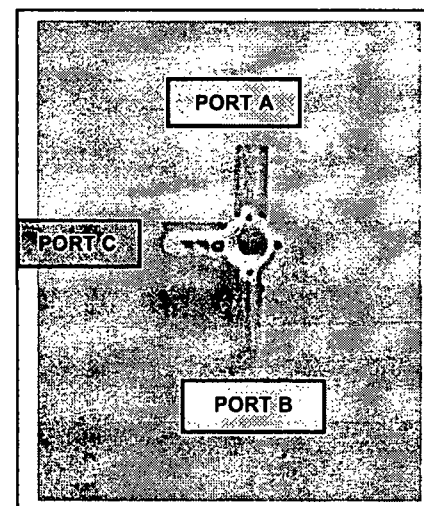
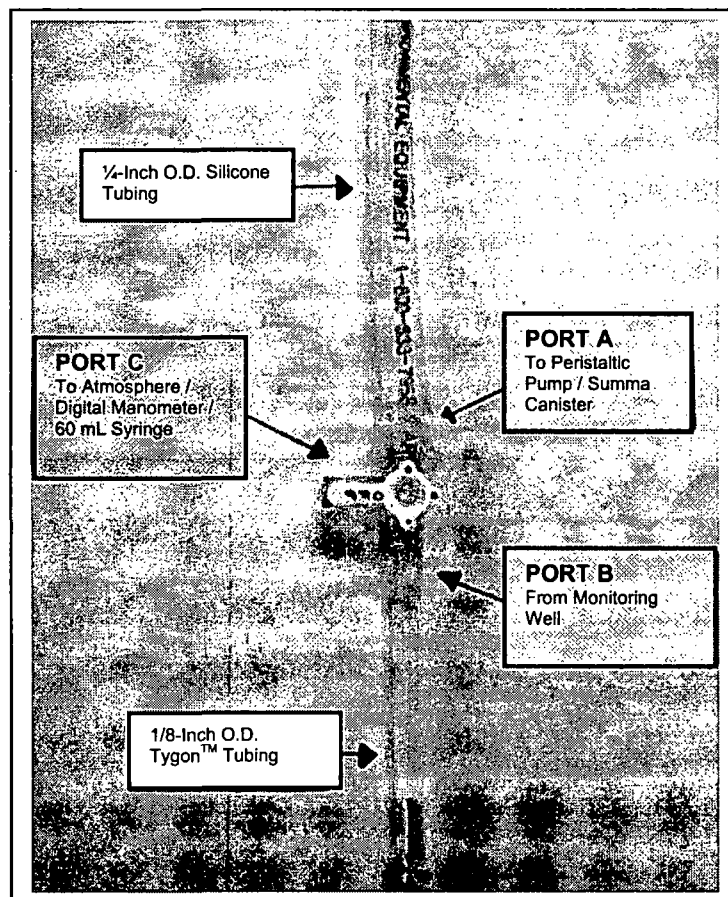
Valve Position #1:

- Closed to Port B (Monitoring Well)
- Open to Port A (Peristaltic Pump)
- Open to Port C (Atmosphere / Digital Manometer / 60 mL Syringe)

The "OFF" handle is positioned directly over Port B. The red arrows opposite the "OFF" handle indicate which ports are open (Ports A & C).

In this valve position, the monitoring well is not open to the atmosphere and will not vent. If the valve is not in this position prior to the start of the effectiveness monitoring (vacuum/pressure measurement and/or Tedlar™ bag sample collection), set the valve to Position #1 and return to this location at least 30 minutes later.

Valve Position #3: Open for Soil Vapor Sample Collection



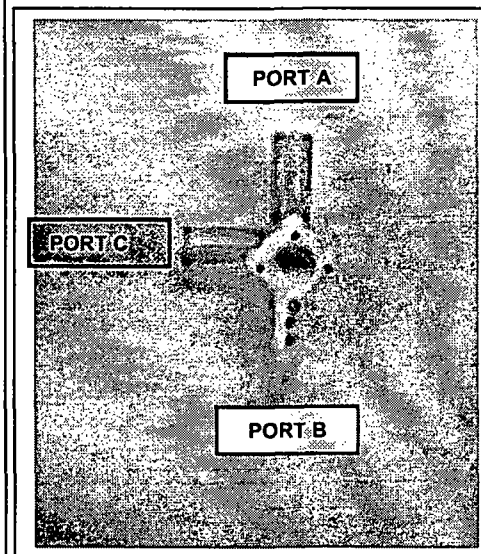
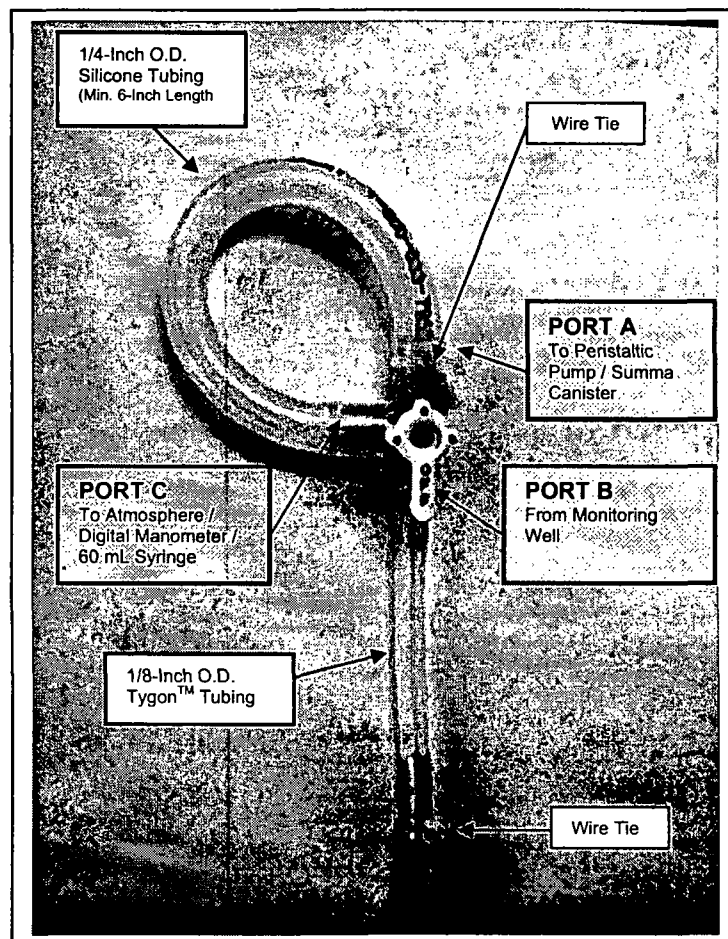
Valve Position #3:

- Closed to Port C (Atmosphere / Digital Manometer / 60 mL Syringe)
- Open to Port A (Peristaltic Pump)
- Open to Port B (Monitoring Well)

The "OFF" handle is positioned directly over Port C. The red arrows opposite the "OFF" handle indicate which ports are open (Ports A & B).

In this valve position, a soil vapor sample can be collected from the monitoring well using the peristaltic pump and Tedlar™ bag. If the valve is in this position prior to the start of the effectiveness monitoring (vacuum/pressure measurement and/or Tedlar™ bag sample collection), set the valve to Position #1 and return to this location at least 30 minutes later.

Post-Monitoring Valve and Tubing Configuration



Post-Monitoring Valve and Tubing Configuration:

Closed to Port B (Monitoring Well)
 Open to Port A (Peristaltic Pump)
 Open to Port C (Atmosphere / Digital Manometer / 60 mL Syringe)

The 4-way micro-valve is set to position #1. The "OFF" handle is positioned directly over Port B. The red arrows opposite the "OFF" handle indicate which ports are open (Ports A & C). In addition, the silicone tubing is configured to form a loop between Port A and Port C and a wire tie is used to secure the silicone tubing to Port A.

In this configuration, the monitoring well is not open to the atmosphere and will not vent. In addition, this configuration minimizes the potential for water infiltration into the 4-way micro-valve. The valve and tubing should be placed in this configuration following vacuum/pressure measurement and/or soil vapor sample collection.

Attachment E

Event-Based Monitoring Field Data Form

DRAFT

EVENT-BASED MONITORING - FIELD DATA FORM

MONITORING TEAM INFORMATION

Zone Number: 1

Date: _____

Team Leader: _____

Company: _____

Assistant: _____

Company: _____

FIELD CONDITIONS

Weather: _____ Temperature: Low: _____ High: _____

Wind Direction: _____ Level of Protection: _____ D

EQUIPMENT & CALIBRATION INFORMATION

Meter Type: Mk III Handheld Digital Manometer

Manufacturer: Dwyer

Model No.: Series 475

FIELD DATA

Arrived at Well (Time)	Well ID	Map Grid	Sample Time (24-Hour)	Vacuum Reading (Inches of H ₂ O)	Minimum Volume to Purge +	Actual Volume Purged	Purge Method	Tedlar Bag Collection Method	Field Equip	Depth to Product (FT BTOC)	Depth to Water (FT BTOC)	Depth to Top of Screen slot	Stabilized Pressure/ Vacuum Reading	Well Secured (Time)	Additional Comments (Yes/No)
	HMW-045A	H5			32.0 L		Hand Pump	Peristaltic Pump	IP			11			
	HMW-045B	H5			52 L		Hand Pump	Peristaltic Pump	IP			23.5			
	HMW-047A	H4			37.5 L		Hand Pump	Peristaltic Pump	WL			13			
	HMW-047B	H4			43 L		Hand Pump	Peristaltic Pump	WL			21			
	MP-078A	G5			4.0 L		Hand Pump	Peristaltic Pump	IP			6.2			
	MP-078B	G5			6.5 L		Hand Pump	Peristaltic Pump	IP			11.7			
	MP-078C	G5			44.5 L		Hand Pump	Peristaltic Pump	IP			16.7			
	MP-079A	G5			8.0 L		Hand Pump	Peristaltic Pump	IP			12.8			
	MP-079B	G5			13.5 L		Hand Pump	Peristaltic Pump	IP			21.2			
	MP-080A	H5			9.0 L		Hand Pump	Peristaltic Pump	IP			8.1			
	MP-080B	H5			13.5 L		Hand Pump	Peristaltic Pump	WL			24.5			
	VMP-001S	H5			68 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-001D	H5			80.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-003	G5			78 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-21S	G5			75.2 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-21M	G5			86.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-21D	G5			107.8 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-027S	G5			76.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			

DRAFT

EVENT-BASED MONITORING - FIELD DATA FORM

MONITORING TEAM INFORMATION

Zone Number: 2

Date: _____

Team Leader: _____

Company: _____

Assistant: _____

Company: _____

FIELD CONDITIONS

Weather: _____ Temperature: _____ Low: _____ High: _____

Wind Direction: _____ Level of Protection: _____ D

EQUIPMENT & CALIBRATION INFORMATION

Meter Type: Mk III Handheld Digital Manometer

Manufacturer: Dwyer

Model No.: Series 475

FIELD DATA

Arrived at Well (Time)	Well ID	Map Grid	Sample Time (24-Hour)	Vacuum Reading (Inches of H ₂ O)	Minimum Volume to Purge +	Actual Volume Purged	Purge Method	Tedlar Bag Collection Method	Field Equip	Depth to Product (FT BTOC)	Depth to Water (FT BTOC)	Depth to Top of Screen	Stablized Pressure/ Vacuum Reading	Well Secured (Time)	Additional Comments (Yes/No)
	HMW-040A	G7			24.5 L		Hand Pump	Peristaltic Pump	WL			9			
	HMW-040B	G7			47 L		Hand Pump	Peristaltic Pump	WL			17.5			
	MP-012S	G7			4.5 L		Hand Pump	Peristaltic Pump	IP			4.75			
	MP-012D	G7			12.8 L		Hand Pump	Peristaltic Pump	IP			17.53			
	MP-030A	H6			9.0 L		Hand Pump	Peristaltic Pump	IP			9			
	MP-030B	H6			14.0 L		Hand Pump	Peristaltic Pump	IP			22.5			
	MP-031A	H6			4.5 L		Hand Pump	Peristaltic Pump	IP			7			
	MP-031B	H6			8.5 L		Hand Pump	Peristaltic Pump	WL			13			
	MP-032A	G6			6.5 L		Hand Pump	Peristaltic Pump	IP			12.3			
	MP-032B	G6			14.5 L		Hand Pump	Peristaltic Pump	IP			19.3			
	MP-033A	G6			4.5 L		Hand Pump	Peristaltic Pump	IP			7			
	MP-033B	G6			7.0 L		Hand Pump	Peristaltic Pump	IP			11			
	MP-033C	G6			12.5 L		Hand Pump	Peristaltic Pump	IP			18.5			
	MP-034A	H6			7.5 L		Hand Pump	Peristaltic Pump	IP	N/A	N/A	N/A			
	MP-034B	H6			11.5 L		Hand Pump	Peristaltic Pump	IP	N/A	N/A	N/A			
	MP-035A	H6			4.5 L		Hand Pump	Peristaltic Pump	IP			7			

DRAFT

FIELD DATA															
Arrived at Well (Time)	Well ID	Map Grid	Sample Time (24-Hour)	Vacuum Reading (Inches of H ₂ O)	Minimum Volume to Purge +	Actual Volume Purged	Purge Method	Tedlar Bag Collection Method	Field Equip	Depth to Product (FT BTOC)	Depth to Water (FT BTOC)	Depth to Top of Screen	Stabilized Pressure/Vacuum Reading	Well Secured (Time)	Additional Comments (Yes/No)
	VMP-089VS	H6			68.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-089S	H6			84.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-101VS	G6			70.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
AGENCY SELECTED BUFFER ZONE SAMPLES															
DUPLICATE SAMPLES															

NOTES: 1. Summary of Zone Monitoring:

42 Total Number of Monitoring Locations/Wells

3 Number of Duplicate Soil Vapor Samples Required

2. Abbreviations: L = Liter; mL = Milliliter; N/A = Not Applicable; NE = Not Encountered;
N = No; Y = Yes

3. * = Use a 0 - 200 Manometer at this well (Scale Range: 0 - 200 Inches of H₂O)

4. ** = Well historically requires over 10 - 20 minutes for the vacuum reading to stabilize

Product measured in Jan 2007-1st Qtr 2007
Quarterly GW Report

IP Interface probe

WL Water Level probe

Mini WL Mini Water Level Probe

IP Interface probe-Well occasionally has product, carefully lower probe to water/product level.

T Traffic Control is required.

DRAFT

FIELD DATA															
Arrived at Well (Time)	Well ID	Map Grid	Sample Time (24-Hour)	Vacuum Reading (Inches of H ₂ O)	Minimum Volume to Purge +	Actual Volume Purged	Purge Method	Tedlar Bag Collection Method	Equip Type	Depth to Product (FT BTOC)	Depth to Water (FT BTOC)	Depth to Top of Screen	Stabilized Pressure/ Vacuum Reading	Well Secured (Time)	Additional Comments (Yes/No)
	T-MP-114S	H8			4.0 L		Hand Pump	Peristaltic Pump	Mini WL			7			
	T-MP-114M	H8			8.5 L		Hand Pump	Peristaltic Pump	Mini WL			16			
	T-MP-114D	H8			10.5 L		Hand Pump	Peristaltic Pump	Mini WL			21			
	VMP-067VS	H8			68.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-067S	H8			88.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-067M	H8			95.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-073S	H9			72.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-073M	H9			92.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-073D	H9			108.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	T-VMP-077VS	H9			67.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	T-VMP-077D	H9			109.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-102VS	H8			70.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-104VS	H9			70.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			

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EVENT-BASED MONITORING - FIELD DATA FORM

MONITORING TEAM INFORMATION

Zone Number: 4

Date: _____

Team Leader: _____

Company: _____

Assistant: _____

Company: _____

FIELD CONDITIONS

Weather: _____

Temperature: _____

Low: _____

High: _____

Wind Direction: _____

Level of Protection: _____

D

EQUIPMENT & CALIBRATION INFORMATION

Meter Type: Mk III Handheld Digital ManometerManufacturer: DwyerModel No.: Series 475

FIELD DATA





Arrived at Well (Time)	Well ID	Map Grid	Sample Time (24-Hour)	Vacuum Reading (Inches of H ₂ O)	Minimum Volume to Purge +	Actual Volume Purged	Purge Method	Tedlar Bag Collection Method	Equip Type	Depth to Product (FT BTOC)	Depth to Water (FT BTOC)	Depth to Top of Screen	Stabilized Pressure/Vacuum Reading	Well Secured (Time)	Additional Comments (Yes/No)
	VMP-019S	G10			67.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-019M	G10			83.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-019D	G10			98.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			

AGENCY SELECTED BUFFER ZONE SAMPLES

DUPLICATE SAMPLES

NOTES: 1. Summary of Zone Monitoring:

- 3 Total Number of Monitoring Locations/Wells
 1 Number of Duplicate Soil Vapor Samples Required
 2. Abbreviations: L = Liter; mL = Milliliter; N/A = Not Applicable; NE = Not Encountered
 N = No; Y = Yes
 3. * = Use a 0 - 200 Manometer at this well (Scale Range: 0 - 200 Inches of H₂O)
 4. ** = Well historically requires over 10 - 20 minutes for the vacuum reading to stabilize

-  Product measured in Jan 2007-1st Qtr 2007
 Quarterly GW Report
 IP Interface probe
 WL Water Level probe
 Mini WL Mini Water Level Probe
 carefully lower probe to water/product level.
 Decon probe carefully.
 Traffic Control is required.

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FIELD DATA

Arrived at Well (Time)	Well ID	Map Grid	Sample Time (24-Hour)	Vacuum Reading (Inches of H ₂ O)	Minimum Volume to Purge +	Actual Volume Purged	Purge Method	Tedlar Bag Collection Method	Equip Type	Depth to Product (FT BTOC)	Depth to Water (FT BTOC)	Depth to Top of Screen	Stabilized Pressure/ Vacuum Reading	Well Secured (Time)	Additional Comments (Yes/No)
	MP-060B	I9			10.0 L		Hand Pump	Peristaltic Pump	IP			16.2			
	MP-064A	J10			4.5 L		Hand Pump	Peristaltic Pump	IP			6			
	MP-064B	J10			10.5 L		Hand Pump	Peristaltic Pump	IP			17			
	MP-088A	I10			4.5 L		Hand Pump	Peristaltic Pump	IP			5.5			
	MP-088B	I10			9.0 L		Hand Pump	Peristaltic Pump	IP			15			
	T-MP-130S	J9			4.0 L		Hand Pump	Peristaltic Pump	Mini WL			7			
	T-MP-130M	J9			6.5 L		Hand Pump	Peristaltic Pump	Mini WL			12			
	T-MP-130D	J9			10.5 L		Hand Pump	Peristaltic Pump	Mini WL			21			
	MP-131S	J10			6 L		Hand Pump	Peristaltic Pump	Mini WL			11			
	MP-131M	J10			12 L		Hand Pump	Peristaltic Pump	Mini WL			23.5			
	T-MP-132S	J10			5.5 L		Hand Pump	Peristaltic Pump	Mini WL			10			
	T-MP-132M	J10			12.0 L		Hand Pump	Peristaltic Pump	Mini WL			23.5			
	VMP-026S	H10			76.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-026M	H10			85.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-026D	H10			100.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-029M	J10			79.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-074VS	H9			69.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-074M	H9			85.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-074D	H9			102.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			

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EVENT-BASED MONITORING - FIELD DATA FORM

MONITORING TEAM INFORMATION

Zone Number: 6

Date: _____

Team Leader: _____

Company: _____

Assistant: _____

Company: _____

FIELD CONDITIONS

Weather: _____ Temperature: Low: _____ High: _____

Wind Direction: _____ Level of Protection: _____ D

EQUIPMENT & CALIBRATION INFORMATION

Meter Type: Mk III Handheld Digital Manometer

Manufacturer: Dwyer

Model No.: Series 475

FIELD DATA

Arrived at Well (Time)	Well ID	Map Grid	Sample Time (24-Hour)	Vacuum Reading (Inches of H ₂ O)	Minimum Volume to Purge +	Actual Volume Purged	Purge Method	Tedlar Bag Collection Method	Equip Type	Depth to Product (FT BTOC)	Depth to Water (FT BTOC)	Depth to Top of Screen	Stabilized Pressure/ Vacuum Reading	Well Secured (Time)	Additional Comments (Yes/No)
	HMW-044A	J9			31.5 L		Hand Pump	Peristaltic Pump	IP			7.1			
	HMW-044B	J9			44 L		Hand Pump	Peristaltic Pump	IP			19			
	MP-047A	I7			7.0 L		Hand Pump	Peristaltic Pump	IP			8.4			
	MP-047B	I7			10.5 L		Hand Pump	Peristaltic Pump	IP			18.7			
	MP-051B	I8			7.0 L		Hand Pump	Peristaltic Pump	IP			13.5			
	MP-051C	I8			11.5 L		Hand Pump	Peristaltic Pump	IP			19			
	MP-052A	H8			5.0 L		Hand Pump	Peristaltic Pump	IP			6.5			
	MP-052B	H8			10.5 L		Hand Pump	Peristaltic Pump	IP			16.8			
	MP-053A	I8			5.5 L		Hand Pump	Peristaltic Pump	IP			7			
	MP-053B	I8			11.5 L		Hand Pump	Peristaltic Pump	IP			19			
	MP-054A	I8			6.0 L		Hand Pump	Peristaltic Pump	IP			7.9			
	MP-054B	I8			11.5 L		Hand Pump	Peristaltic Pump	IP			19			
	MP-055A	J8			8.0 L		Hand Pump	Peristaltic Pump	IP			7.3			
	MP-055B	J8			11.5 L		Hand Pump	Peristaltic Pump	IP			19.3			
	MP-056A	I8			5.5 L		Hand Pump	Peristaltic Pump	IP			6.5			
	MP-056B	I8			13.0 L		Hand Pump	Peristaltic Pump	IP			22			

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FIELD DATA															
Arrived at Well (Time)	Well ID	Map Grid	Sample Time (24-Hour)	Vacuum Reading (Inches of H ₂ O)	Minimum Volume to Purge +	Actual Volume Purged	Purge Method	Tedlar Bag Collection Method	Equip Type	Depth to Product (FT BTOC)	Depth to Water (FT BTOC)	Depth to Top of Screen	Stabilized Pressure/Vacuum Reading	Well Secured (Time)	Additional Comments (Yes/No)
	VMP-076VS	J9			67.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-076S	J9			77.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-076M	J9			96.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-094VS	I7			68.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
	VMP-094S	I7			83.0 mL		60 mL Syringe	Peristaltic Pump	N/A	N/A	N/A	N/A			
AGENCY SELECTED BUFFER ZONE SAMPLES															
DUPLICATE SAMPLES															

NOTES: 1. Summary of Zone Monitoring:

47 Total Number of Monitoring Locations/Wells

3 Number of Duplicate Soil Vapor Samples Required

2. Abbreviations: L = Liter; mL = Milliliter; N/A = Not Applicable; NE = Not Encountered

N = No; Y = Yes

3. * = Use a 0 - 200 Manometer at this well (Scale Range: 0 - 200 Inches of H₂O)

4. ** = Well historically requires over 10 - 20 minutes for the vacuum reading to stabilize

Product measured in Jan 2007-1st Qtr 2007
Quarterly GW Report

IP Interface probe

WL Water Level probe

Mini WL Mini Water Level Probe

IP Interface probe-Well occasionally has product,
carefully lower probe to water/product level.

T- Traffic Control is required.

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FIELD DATA															
Arrived at Well (Time)	Well ID	Map Grid	Sample Time (24-Hour)	Vacuum Reading (Inches of H ₂ O)	Minimum Volume to Purge +	Actual Volume Purged	Purge Method	Tedlar Bag Collection Method	Equip Type	Depth to Product (FT BTOC)	Depth to Water (FT BTOC)	Depth to Top of Screen	Stabilized Pressure/ Vacuum Reading	Well Secured (Time)	Additional Comments (Yes/No)
	MP-045A	I7			6.0 L		Hand Pump	Peristaltic Pump	IP			9			
	MP-045B	I7			11.5 L		Hand Pump	Peristaltic Pump	IP			18.2			
	MP-046A	I7			7.0 L		Hand Pump	Peristaltic Pump	IP			9			
	MP-046B	I7			11.5 L		Hand Pump	Peristaltic Pump	IP			18.5			
	T-MP-085A	I5			5.0 L		Hand Pump	Peristaltic Pump	IP			8.2			
	T-MP-085B	I5			11.0 L		Hand Pump	Peristaltic Pump	WL			14.2			
	T-MP-117S	I4			6.00 L		Hand Pump	Peristaltic Pump	Mini WL			10.5			
	T-MP-117M	I4			11.00 L		Hand Pump	Peristaltic Pump	Mini WL			22			
	MP-121S	I5			5.50 L		Hand Pump	Peristaltic Pump	Mini WL			10			
	MP-121M	I5			10.00 L		Hand Pump	Peristaltic Pump	Mini WL			19.5			
	T-MP-122S	I6			5.00 L		Hand Pump	Peristaltic Pump	Mini WL			8.5			
	T-MP-122M	I6			9.5 L		Hand Pump	Peristaltic Pump	Mini WL			18			
	T-MP-123S	I6			5.00 L		Hand Pump	Peristaltic Pump	Mini WL			9			
	T-MP-123M	I6			8.50 L		Hand Pump	Peristaltic Pump	Mini WL			16.5			
	T-MP-123D	I6			10.50 L		Hand Pump	Peristaltic Pump	Mini WL			21			
	MP-124S	I6			4.5 L		Hand Pump	Peristaltic Pump	Mini WL			8			
	MP-124M	I6			6.5 L		Hand Pump	Peristaltic Pump	Mini WL			12.5			
	MP-124D	I6			10.50 L		Hand Pump	Peristaltic Pump	Mini WL			19.5			
	MP-125S	I6			5.00 L		Hand Pump	Peristaltic Pump	Mini WL			9			
	MP-125M	I6			7.00 L		Hand Pump	Peristaltic Pump	Mini WL			13.5			
	MP-125D	I6			10.50 L		Hand Pump	Peristaltic Pump	Mini WL			19.5			

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EVENT-BASED MONITORING FORM - ADDITIONAL COMMENTS

MONITORING TEAM INFORMATION

Team Number: _____

Date: _____

Team Leader: (first & last) _____

Company: _____

Assistant: (first & last) _____

Company: _____

Well ID	Comment	Initials (ABC)

Attachment F

Soil Vapor Field Laboratory Screening Procedure (HWG SOP 03)

Standard Operating Procedures

Title of SOP: Soil Vapor Field Laboratory Screening
Site Location: Hartford, Illinois

HWG SOP No.: 03
Revision: 0
Date: July 2008

1.0 INTRODUCTION

The purpose of this Standard Operating Procedure (SOP) is to provide a consistent methodology for the screening of soil vapor samples at the Hartford Working Group (HWG) site. Whenever possible, the soil vapor samples collected throughout the Village for the various work tasks will be screened on the same day of collection. If same-day screening is not possible due to time constraints, instrument problems, etc, the samples will be screened within 24-hours of sample collection. This SOP details the necessary procedures to follow in order to ensure that valid total vapor phase hydrocarbons, oxygen, methane and carbon dioxide concentration data is collected and adequately documented. These procedures are applicable to any vapor sample collected at the HWG site, but are particularly useful for samples collected from vapor monitoring ports (VMPs), monitoring ports (MPs), and sub-slab (SS) ports that are located throughout the village. Important uses of these data include:

- Evaluation of indoor air or sub-slab methane concentrations;
- Screening of indoor air or sub-slab petroleum hydrocarbon concentrations; and
- Evaluation of the performance of the village-wide soil vapor extraction system performance.

2.0 PROCEDURE

The following instruments will be used to screen soil vapor samples:

- TVA-1000 or performance equivalent for volatile organic compounds (VOCs) and methane by flame ionization detector (FID) and for VOCs by photoionization detector (PID);
- PPbRAE or performance equivalent for VOCs by PID for low-concentration samples; and
- LANDTEC GEM-2000 or performance equivalent for oxygen and carbon dioxide.

Immediately prior to use, each instrument will undergo a calibration check. In the event that instrument accuracy is not within 15-percent of the designated calibration check standard concentration, the instrument will be recalibrated. Field personnel will follow applicable instrument operation SOP's and/or manufacturer's recommended procedures for the calibration and operation of the instruments. Calibration data will be documented on the appropriate calibration forms (attached) for each instrument.

3.0 REQUIRED MATERIALS FOR SCREENING SAMPLES

The following materials will be used to perform sample screening, either on-site or at a dedicated sample screening station:

- TVA-1000, PPbRAE, and LANDTEC GEM-2000 real-time monitors;
- Calibration gas cylinders, including;
 - Methane in air at concentrations of 50; 500; 5,000, and 32,500 ppmv;
 - Isobutylene in air at concentrations of 10, 50 and 1,000 ppmv;
 - hydrocarbon-free air; and
 - 35 percent by volume concentration CO₂
- Regulators for calibration gas cylinders;

Standard Operating Procedures

Title of SOP: Soil Vapor Field Laboratory Screening
Site Location: Hartford, Illinois

HWG SOP No.: 03
Revision: 0
Date: July 2008

analysis. The 10:1 dilution probe will be calibrated using the 32,500 ppmv methane standard. Calibration of the dilution probe is considered complete when the FID response to this standard is within ± 15 -percent of 3,250 ppmv.

The critical orifice in the dilution probe is density-dependent. As it will be calibrated using a 3.25% methane standard that has a density of 98.6% that of air, samples that have a density significantly different from that will be subject to some level of deterministic error. Samples that have extremely high hydrocarbon or methane concentrations have the potential to have significantly varying densities, which can introduce significant error when the analysis relies on the dilution probe. For example, error in excess of 10% will be present at concentrations of methane above 40% (if significant concentrations of petroleum hydrocarbons are not present).

Because the average density of petroleum hydrocarbon vapors is variable, the error is not as readily quantified for elevated concentrations of petroleum hydrocarbons. Assuming an average density of 2.5 times that of air (i.e., density equivalent to isopentane), error in excess of 10% will be present at concentrations of petroleum hydrocarbon above 17% (if significant concentrations of methane are not present).

The density error associated with methane and heavier hydrocarbons have the potential to offset each other. Because the average density of measured hydrocarbon will not be known, data associated with an estimated error greater than 10% due to the presence of hydrocarbon or methane will be flagged as estimated, rather than corrected for an assumed density. As the concentrations at which significant error is introduced are well above project action levels, estimated concentrations at these ranges are considered adequate to meet project data quality objectives.

4.3 Analysis of Samples Utilizing a Charcoal Scrubber Tube to Filter Heavy Hydrocarbons

Use of the sorbent tube to screen out hydrocarbons other than methane affects the function of the FID instrument by lessening the flow of air through the detector. Preliminary testing indicates that a 25% to 30% reduction in instrument response occurs over the linear calibration range of the instrument. To calibrate the instrument for use of the sorbent tube, the 50, 500 and 5,000-ppmv methane standards will be run with the sorbent tube to determine the relative response of the instrument to methane passed through the sorbent tube. The relative response factor (RRF) for each calibration standard will be calculated as:

$$RRF = \frac{FID_{sorb}}{FID_{raw}} ;$$

Where;

RRF = relative response factor;

FID_{sorb} = Instrument response with sorbent tube; and

FID_{raw} = Instrument response to calibration standard without sorbent tube

The average RRF shall be used as a correction factor for samples analyzed using the sorbent tube. It is not necessary to correct instrument response (other than multiplying the displayed value by 10) when using the

Standard Operating Procedures

Title of SOP: Soil Vapor Field Laboratory Screening
Site Location: Hartford, Illinois

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HC = hydrocarbon concentration (ppmv); and

C_{raw} = FID reading without sorbent tube (ppmv)

5.2 Procedures for Sample Screening at a Dedicated Sample Analysis Station

The sampling instrumentation for the dedicated sample analysis station has been configured such that the TVA-1000 can be operated with a 10:1 dilution valve, if concentrations are outside the operational range of the FID (i.e., if there is insufficient oxygen to support the FID flame or if the sample is above the linear range of the instrument).

- Open the valve on the Tedlar™ bag sample approximately one turn and attach to the inlet of the LANDTEC Model GEM-2000 landfill gas analyzer. Quickly document oxygen and carbon dioxide concentrations on the appropriate sample screening data sheet;
- Immediately connect the sample bag to the PPbRAE PID instrument and quickly document the concentration on the appropriate data sheet. If the instrument registers over range, the VOC concentration by PID will be completed using the TVA-1000 PID;
- If the oxygen concentration in the sample is less than 16-percent, configure the TVA-1000 for use with a 10-to-1 dilution probe. The dilution probe will allow for the sample to be screened by FID without flameout associated with low oxygen concentration samples. The dilution probe must be separately calibrated and should be used for sample analysis by FID only;
- Set the TVA-1000 to sample through the SKC sorbent tube. Record the reading as the methane concentration. If the 10-to-1 dilution probe is used, the displayed concentration (FID) must be multiplied by 10;
- Switch the TVA-1000 to sample without the sorbent tube. Immediately connect the sample bag to the TVA-1000 probe inlet and quickly record the vapor concentration by FID on the appropriate data sheet. If the 10-to-1 dilution probe is used, the displayed concentration (FID) must be multiplied by 10; and
- The hydrocarbon (HC) concentration portion of the FID response should be calculated as:

$$HC = C_{raw} - C_{meth}$$

5.3 Procedures Applicable to All Sample Screening

Because concentrations of hydrocarbons in some samples are elevated, the carbon in the sorbent tube can be saturated with hydrocarbon relatively quickly. Therefore, the following protocols are in place to assure quality data:

- The sorbent tube will be replaced at least every 10 samples;
- The sorbent tube will also be replaced, if breakthrough is observed or if concentrations do not go to zero after sample is removed from analyzer inlet; and

Total Hydrocarbon Instrument Calibration Log

Instrument Serial Number: _____ Model TVA 1000 S/N _____

Time Of Calibration	Type and Concentration of Cal. Gas	Instrument Response	FID Response w/scrubber
	HC-Free Air (FID) 0-PPM		N/A
	Methane (FID) = 50-PPM		
	Methane (FID) 500-PPM		
	Methane (FID) 5,000-PPM (set cal pt.)		
With 10:1 Dilution Probe	Methane (FID) = 32,500-PPM		N/A
	HC-Free Air (FID) 0-PPM		N/A
	Methane (FID) = 50- PPM		N/A
	Methane (FID) 500- PPM		N/A
	Methane (FID) 5,000-PPM (set cal pt.)		N/A
With 10:1 Dilution Probe	Methane (FID) = 32,500-PPM		N/A
	HC-Free Air (FID) 0-PPM		N/A
	Methane (FID) = 50- PPM		N/A
	Methane (FID) 500- PPM		N/A
	Methane (FID) 5,000-PPM (set cal pt.)		N/A
With 10:1 Dilution Probe	Methane (FID) = 32,500-PPM		N/A
Instrument Bump Check	Zero Air	5000-PPM	32,500-PPM (w/10:1 probe)

Relative Response (FID) to 1,003-PPM Isobutylene = _____

Average relative response (FID) with sorbent (scrubber) tube = _____

Calibration Date: _____ Technician: _____



Total Hydrocarbon (PID) Instrument Calibration Log

Instrument Serial Number: PPbRAE s/n

Time Of Calibration	Type and Concentration of Cal. Gas	Instrument Response	Comments
TIME:	HC-Free Air (PID) 0-PPM		
	Isobutylene (PID) = 10-PPM		
TIME:	HC-Free Air (PID) 0-PPM		
	Isobutylene (PID) = 10-PPM		
TIME:	HC-Free Air (PID) 0-PPM		
	Isobutylene (PID) = 10-PPM		

Calibration Date: _____ Technician: _____

Attachment G

Event-Based Monitoring Probe Screening Results Form

(Draft Work in Progress) EVENT-BASED MONITORING - PROBE SCREENING RESULTS FORM

Event Date: _____

FIELD SCREENING TEAM INFORMATION

Team Leader: _____
Assistant: _____

Company: _____
Company: _____

FIELD SCREENING DATA

Well ID	Zone Number	SAMPLE DATE	SAMPLE TIME (24-Hour)	FIXED GASES		SOIL VAPOR CONCENTRATIONS			
				O ₂ (ppmv)	CO ₂ (ppmv)	PID (ppmv)	THC (ppmv)	CH ₄ (ppmv)	PHC (ppmv)
HMW-007	7								
HMW-013	7								
HMW-040A	2								
HMW-040B	2								
HMW-042A	5								
HMW-044A	6								
HMW-044B	6								
HMW-045A	1								
HMW-045B	1								
HMW-047A	1								
HMW-047B	1								
HMW-053A	5								
HMW-054A	5								
MP-009S	7								
MP-009D	7								

(Draft Work in Progress) EVENT-BASED MONITORING - PROBE SCREENING RESULTS FORM

Event Date: _____

FIELD SCREENING TEAM INFORMATION

Team Leader: _____
 Assistant: _____

Company: _____
 Company: _____

FIELD SCREENING DATA

Well ID	Zone Number	SAMPLE DATE	SAMPLE TIME (24-Hour)	FIXED GASES		SOIL VAPOR CONCENTRATIONS			
				O ₂ (ppmv)	CO ₂ (ppmv)	PID (ppmv)	THC (ppmv)	CH ₄ (ppmv)	PHC (ppmv)
MP-031A	2								
MP-031B	2								
MP-032A	2								
MP-032B	2								
MP-033A	2								
MP-033B	2								
MP-033C	2								
MP-034A	2								
MP-034B	2								
MP-035A	2								
MP-035B	2								
MP-035C	2								
MP-036A	2								
MP-036B	2								
MP-037A	7								

(Draft Work in Progress) EVENT-BASED MONITORING - PROBE SCREENING RESULTS FORM

Event Date: _____

FIELD SCREENING TEAM INFORMATION

Team Leader: _____
 Assistant: _____

Company: _____
 Company: _____

FIELD SCREENING DATA

Well ID	Zone Number	SAMPLE DATE	SAMPLE TIME (24-Hour)	FIXED GASES		SOIL VAPOR CONCENTRATIONS			
				O ₂ (ppmv)	CO ₂ (ppmv)	PID (ppmv)	THC (ppmv)	CH ₄ (ppmv)	PHC (ppmv)
MP-044C	7								
MP-045A	7								
MP-045B	7								
MP-046A	7								
MP-046B	7								
MP-047A	6								
MP-047B	6								
MP-048A	3								
MP-048B	3								
MP-049A	3								
MP-049B	3								
MP-051B	6								
MP-051C	6								
MP-052A	6								
MP-052B	6								

(Draft Work in Progress) EVENT-BASED MONITORING - PROBE SCREENING RESULTS FORM

Event Date: _____

FIELD SCREENING TEAM INFORMATION

Team Leader: _____
 Assistant: _____

Company: _____
 Company: _____

FIELD SCREENING DATA

Well ID	Zone Number	SAMPLE DATE	SAMPLE TIME (24-Hour)	FIXED GASES		SOIL VAPOR CONCENTRATIONS			
				O ₂ (ppmv)	CO ₂ (ppmv)	PID (ppmv)	THC (ppmv)	CH ₄ (ppmv)	PHC (ppmv)
MP-060B	5								
MP-064A	5								
MP-064B	5								
MP-077A	6								
MP-077B	6								
MP-078A	1								
MP-078B	1								
MP-078C	1								
MP-079A	1								
MP-079B	1								
MP-080A	1								
MP-080B	1								
MP-082A	3								
MP-082B	3								
MP-083A	2								

(Draft Work in Progress) EVENT-BASED MONITORING - PROBE SCREENING RESULTS FORM

Event Date: _____

FIELD SCREENING TEAM INFORMATION

Team Leader: _____
Assistant: _____

Company: _____
Company: _____

FIELD SCREENING DATA

Well ID	Zone Number	SAMPLE DATE	SAMPLE TIME (24-Hour)	FIXED GASES		SOIL VAPOR CONCENTRATIONS			
				O ₂ (ppmv)	CO ₂ (ppmv)	PID (ppmv)	THC (ppmv)	CH ₄ (ppmv)	PHC (ppmv)
MP-110M	3								
MP-110D	3								
MP-114S	3								
MP-114M	3								
MP-114D	3								
MP-115S	2								
MP-115D	2								
MP-117S	7								
MP-117M	7								
MP-121S	7								
MP-121M	7								
MP-122S	7								
MP-122M	7								
MP-123S	7								
MP-123M	7								

(Draft Work in Progress) EVENT-BASED MONITORING - PROBE SCREENING RESULTS FORM

Event Date: _____

FIELD SCREENING TEAM INFORMATION

Team Leader: _____
 Assistant: _____

Company: _____
 Company: _____

FIELD SCREENING DATA

Well ID	Zone Number	SAMPLE DATE	SAMPLE TIME (24-Hour)	FIXED GASES		SOIL VAPOR CONCENTRATIONS			
				O ₂ (ppmv)	CO ₂ (ppmv)	PID (ppmv)	THC (ppmv)	CH ₄ (ppmv)	PHC (ppmv)
MP-130M	5								
MP-130D	5								
MP-131S	5								
MP-131M	5								
MP-132S	5								
MP-132M	5								
VMP-001S	1								
VMP-001D	1								
VMP-003	1								
VMP-015VS	6								
VMP-015M	6								
VMP-015D	6								
VMP-019S	4								
VMP-019M	4								
VMP-019D	4								

(Draft Work in Progress) EVENT-BASED MONITORING - PROBE SCREENING RESULTS FORM

Event Date: _____

FIELD SCREENING TEAM INFORMATION									
Team Leader: _____					Company: _____				
Assistant: _____					Company: _____				
FIELD SCREENING DATA									
Well ID	Zone Number	SAMPLE DATE	SAMPLE TIME (24-Hour)	FIXED GASES		SOIL VAPOR CONCENTRATIONS			
				O ₂ (ppmv)	CO ₂ (ppmv)	PID (ppmv)	THC (ppmv)	CH ₄ (ppmv)	PHC (ppmv)
VMP-044VS	2								
VMP-044S	2								
VMP-044D	2								
VMP-053VS	1								
VMP-053S	1								
VMP-058VS	1								
VMP-058S	1								
VMP-064S	7								
VMP-064M	7								
VMP-065VS	6								
VMP-065S	6								
VMP-065M	6								
VMP-067VS	3								
VMP-067S	3								
VMP-067M	3								

(Draft Work in Progress) EVENT-BASED MONITORING - PROBE SCREENING RESULTS FORM

Event Date: _____

FIELD SCREENING TEAM INFORMATION

Team Leader: _____
Assistant: _____

Company: _____
Company: _____

FIELD SCREENING DATA

Well ID	Zone Number	SAMPLE DATE	SAMPLE TIME (24-Hour)	FIXED GASES		SOIL VAPOR CONCENTRATIONS			
				O ₂ (ppmv)	CO ₂ (ppmv)	PID (ppmv)	THC (ppmv)	CH ₄ (ppmv)	PHC (ppmv)
VMP-074M	5								
VMP-074D	5								
VMP-076VS	6								
VMP-076S	6								
VMP-076M	6								
VMP-077VS	3								
VMP-077D	3								
VMP-078VS	5								
VMP-078M	5								
VMP-078D	5								
VMP-080VS	5								
VMP-080S	5								
VMP-080D	5								
VMP-081VS	5								
VMP-081M	5								

(Draft Work in Progress) EVENT-BASED MONITORING - PROBE SCREENING RESULTS FORM

Event Date: _____

FIELD SCREENING TEAM INFORMATION

Team Leader: _____
Assistant: _____

Company: _____
Company: _____

FIELD SCREENING DATA

Well ID	Zone Number	SAMPLE DATE	SAMPLE TIME (24-Hour)	FIXED GASES		SOIL VAPOR CONCENTRATIONS			
				O ₂ (ppmv)	CO ₂ (ppmv)	PID (ppmv)	THC (ppmv)	CH ₄ (ppmv)	PHC (ppmv)
BUFFER ZONE SAMPLE LOCATIONS TO BE SELECTED BY AGENCIES (If Applicable)									
DUPLICATE SAMPLES (If Applicable)									

Attachment H

Notification Card

DRAFT

Notification Postcard

Due to a recent rapid rise in Mississippi River stage level, the Hartford Working Group, in coordination with USEPA, Illinois EPA, and Illinois Department of Public Health, will be conducting monitoring throughout the northern part of Hartford. This monitoring will include screening of indoor air and sub-slab monitoring ports (SSMPs) at homes and businesses on certain streets in the Village. If you would like to have your property screened during this event, please contact AECOM (ENSR), consultant for the Hartford Working Group, immediately at 618-251-5140. If no one is available, please leave your name, address and a phone number on the answering machine, and a representative will call you back promptly to schedule an appointment.

If you have any questions about this or any other Hartford Working Group activity, please contact Robert Miner toll-free at 1-888-974-8379.

Attachment I

Event-Based Monitoring – Residential Monitoring Data Sheet

**EVENT-BASED MONITORING-
RESIDENTIAL EFFECTIVENESS MONITORING DATA SHEET**

ASSESSORS (initials)

(Please include NA for not applicable where necessary)

Date: _____

Time: (survey time) _____

Address: _____

Residential Contact: _____

Phone: (Home) _____

(Work) _____

**Any odor issues at time
of assessment?**

Yes ☐ No ☐

**If yes, when was the
odor observed?**

Describe the odor.

SUMMA™ Air Sample Locations

First floor: _____

Basement: _____

Sub-Slab Air Sample Location(s)

Screening sample(s) collected? Yes ☐ No ☐ If no, provide explanation in comments. _____

List sample location(s): _____

SUMMA™ sample(s) collected? Yes ☐ No ☐ If no, provide explanation in comments. _____

List sample location(s): _____

Additional comments (if any)?

Indoor Air Screening Table

Date:

Address:

[illegible]

Notes:

Temperature in Fahrenheit:

Weather Conditions:

Tech:

Attachment J

Compilation of References for the EBMP

ATTACHMENT J

Compilation of References for the EBMP

Comparison of Unvented and Vented Pneumatic Data, dated December 1, 2008,
Cross Plots – Benzene vs. FID (Corrected for Methane), March 27, 2008,
Cross Plots – Isopentane vs. FID (Corrected for Methane), March 27, 2008,
Cross Plots – Butane vs. FID (Corrected for Methane), March 27, 2008,
Cross Plots – Hexane vs. FID (Corrected for Methane), March 27, 2008,
Cross Plots – Benzene vs. FID (Without Methane Correction), April 29, 2008,
Cross Plots – Isopentane vs. FID (Without Methane Correction), April 29, 2008,
Cross Plots – Butane vs. FID (Without Methane Correction), April 29, 2008,
Cross Plots – Hexane vs. FID (Without Methane Correction), April 29, 2008,
Event Definition Analysis, dated April 11, 2008,
False Negative Comparison by Sampling Event, dated May 7, 2008,
July 2008 and September 2008 SVE Effectiveness Monitoring Events; EVS Maps, dated November 14, 2008,
September 2008 SVE Effectiveness Monitoring Event; EVS Maps dated November 6, 2008,
Technical Basis for Event-Based Monitoring Thresholds, dated November 18, 2008,
Technical Basis for Well Mapping, date November 14, 2008, and
Time Series Memo; September 25, 2006